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THE TROPICAL FRUIT FLIES (DIPTERA: TEPHTRITIDAE: DACINAE) OF THE AUSTRALASIAN AND OCEANIAN REGIONS

RICHARD A.I. DREW

Richard A.I. Drew. 1989 3 31: The tropical fruit flies (Diptera: Tephritidae: Dacinae) of the Australasian and Oceanian regions. *Mem. Qd Mus.* 26: 1-521. Brisbane. ISSN 0079-8835.

The Australasian and Oceanian Dacinae (290 species) are treated within a revised generic classification comprising only 2 genera, *Bactrocera* Macquart (with 21 subgenera) and *Dacus* Fabricius (with 4 subgenera). Seven new subgenera are described: *Heminotodacus*, *Hemiparatriadacus*, *Hemisurstylus*, *Niuginidacus*, *Queenslandacus*, *Semicallantha*, *Trypetidacus*. 109 new species are described: *Bactrocera abdoaurantiaca*, *B. abdominalinigra*, *B. absidata*, *B. abundans*, *B. aemula*, *B. aithogaster*, *B. alampeta*, *B. anchitrichota*, *B. anfracta*, *B. angusticostata*, *B. angustifasciata*, *B. assita*, *B. atriliniellata*, *B. aurantiventer*, *B. batemani*, *B. buinensis*, *B. bullata*, *B. buloloensis*, *B. buvittata*, *B. caledoniensis*, *B. cinnamea*, *B. circumusae*, *B. citroides*, *B. commina*, *B. congener*, *B. consectorata*, *B. contermina*, *B. contigua*, *B. curreyi*, *B. dapsiles*, *B. daruensis*, *B. daula*, *B. diallagma*, *B. diospyri*, *B. dissidens*, *B. eximia*, *B. fergussoniensis*, *B. finitima*, *B. furfurosa*, *B. furvilineata*, *B. furvescens*, *B. fuscalata*, *B. honiarae*, *B. hypomelaina*, *B. inconstans*, *B. invisitata*, *B. ismayi*, *B. kelaena*, *B. laticosta*, *B. latilineata*, *B. latissima*, *B. macrovittata*, *B. melanogaster*, *B. melanoscutata*, *B. melanothoracica*, *B. mesonotaittha*, *B. mesonotochra*, *B. mimulus*, *B. morobiensis*, *B. morula*, *B. neocheesmanae*, *B. neopagdeni*, *B. nigrovittata*, *B. obfusca*, *B. oblineata*, *B. ochracea*, *B. propedistincta*, *B. parafrauenfeldi*, *B. paramusae*, *B. paulula*, *B. penefurva*, *B. petila*, *B. pisinna*, *B. popondettiensis*, *B. proluxa*, *B. quasisilvicola*, *B. reclinata*, *B. repanda*, *B. retrorsa*, *B. rhabdota*, *B. robertsi*, *B. samoae*, *B. sandaracina*, *B. sepikae*, *B. singularis*, *B. surrufula*, *B. terminaliae*, *B. thistletoni*, *B. tinomiscii*, *B. turneri*, *B. unichromata*, *B. unilateralis*, *B. unilineata*, *B. unirufa*, *B. ustulata*, *Dacus alarifumidus*, *D. alulapictus*, *D. aquilus*, *D. badius*, *D. concolor*, *D. discors*, *D. dissimilis*, *D. impar*, *D. maprikensis*, *D. melanohumeralis*, *D. memnonius*, *D. nigriculus*, *D. palmerensis*, *D. secamoneae*. Three new names (*B. neonigrita*, *B. neopallescens*, *B. trilineola*) are proposed for preoccupied ones. In the subgenus *Bactrocera*, 20 species complexes are defined. Five new synonymies are established: *Afrodacus flavinotus* May = *Bactrocera tigrina* (May), *Afrodacus furvus* May = *Bactrocera tigrina* (May), *Afrodacus mesoniger* May = *Bactrocera aberrans* (Hardy), *Neodacus strigifinis atritus* May = *Bactrocera strigifinis* (Walker), *Pacifodacus* Drew = *Sinodacus* Zia. Lectotypes are designated for 29 taxa: *Afrodacus brunneus* Perkins and May, *Asiadacus calophylli* Perkins and May, *Chaetodacus bancroftii* Tryon, *Chaetodacus barringtoniae* Tryon, *Chaetodacus bryoniae* Tryon, *Chaetodacus fagraea* Tryon, *Chaetodacus halfordiae* Tryon, *Chaetodacus humeralis* Perkins, *Chaetodacus musae* Tryon, *Chaetodacus tryoni* var. *sarcocephali* Tryon, *Dacus aequalis* Coquillett, *Dacus cucurbitae* Coquillett, *Dacus curvipennis* Froggatt, *Dacus kirki* Froggatt, *Dacus melanotus* Coquillett, *Dacus niger* Tryon, *Dacus ornatissimus* Froggatt, *Dacus passiflorae* Froggatt, *Dacus signatifer* Tryon, *Melanodacus satanellus* Hering, *Neodacus newmani* Perkins, *Strumeta bilineata* Perkins and May, *Strumeta cacuminata* Hering, *Strumeta endiandrae* Perkins and May, *Strumeta fuscatus* Perkins and May, *Strumeta lineata* Perkins, *Strumeta manskii* Perkins and May, *Strumeta melas* Perkins and May, *Strumeta pallidus* Perkins and May. Keys to genera, subgenera and species are provided. Information is given on location of type specimens, host plants, attractant records, geographic distribution and taxonomic relationships.

□ Fruit flies, Dacinae, Australasian, Oceanian, revision, generic classification, keys, host plants, attractants.

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INTRODUCTION

Tropical fruit flies (Tephritidae: Dacinae) are major pests of fruit and vegetable crops throughout most of the tropical and subtropical world and their taxonomy, biology and control have been much researched. This study includes species east of Weber's Line (plus *B. timorensis* (Perkins) from Timor) to the Society Islands and south of the equator. In Oceania, Dacinae are absent from New Zealand and Norfolk Island. Following the introduction of pest species of fruit fly into various countries (e.g. *Dacus dorsalis* Hendel into Hawaii), plant quarantine authorities recognised the importance both of restricting transport of fresh fruits and vegetables within and between countries (Stout, 1982) and of accurate identification of species. In Australia, Plant Quarantine has maintained an extensive surveillance programme since 1976 for the detection of introduced exotic fruit flies, and surveys in neighbouring areas assessed their fruit fly fauna and the distribution and pest status of the species. Many resulting specimens and data were used in this study. Bateman (1972), Prokopy (1977) and Fletcher (1987) have reviewed the ecological information.

The first taxonomy on Australian fruit flies was the description of *Dacus expandens* Walker (1859) and *D. strigifinis* Walker (1861). The type specimens however, were collected at Aru Island and the Moluccas respectively. The earliest work within Australia was Froggatt's (1897) description of *D. tryoni*, followed by studies of French (1907) and Coquillett (1909). Tryon (1927) was the first to describe a series of species (9) within a generic classification using *Bactrocera* Macquart, *Chaetodacus* Bezzi and *Dacus* Fabricius. Perkins (1934, 1937, 1939) described a number of genera and species and included the Australian fauna in *Austrodacus* Perkins, *Callantra* Walker, *Chaetodacus* Bezzi, *Daculus* Speiser, *Melanodacus* Perkins, *Neodacus* Perkins and *Strumeta* Walker. Hering (1941a) described 1 species while Perkins and May (1949) described 9. Hardy's (1951) revision of Australian fruit flies treated 32 species in 2 genera (*Callantra* Walker and *Dacus* Fabricius) and 12 subgenera of *Dacus* (*Afrodacus* Bezzi, *Asiadacus* Perkins, *Austrodacus*, *Daculus*, *Gymnodacus* Munro, *Hemizeugodacus* Hardy, *Heterodaculus* Hardy, *Melanodacus*, *Neodacus*, *Paratridacus* Shiraki, *Strumeta*, *Zeugodacus* Hendel). May (1951, 1952, 1953, 1955, 1957b, 1962a, 1962b, 1963, 1965, 1967) described 26 species and placed the fauna in 12 genera (*Callantra* plus 11 of the subgenera of Hardy, 1951). Drew (1972a, 1972b, 1979) and Drew et al. (1981)

described additional species in 2 genera (*Callantra* and *Dacus*). Drew and Hardy (1981), using electrophoretic and biological data, described 1 of the many sibling species now known to occur in the Dacinae.

For non-Australian Dacinae, Macquart (1835) and Walker (1859, 1860, 1861, 1862, 1864, 1865) published the first species from material collected on the voyages of Alfred Russel Wallace. Schiner (1868), Coquillett (1899, 1910), Broun (1905), Froggatt (1899, 1909, 1910), Hendel (1927b), Bezzi (1928) and Aubertin (1929) described additional species. Malloch (1931, 1932, 1938, 1939a, 1939b) presented species descriptions and keys to species in 4 subgenera of *Dacus* (*Callantra*, *Chaetodacus*, *Zeugodacus* and *Bactrocera*). Perkins (1939) published descriptions of genera and species and keys to species in 8 genera (*Apodacus* Perkins, *Daculus*, *Neodacus*, *Notodacus* Perkins, *Paradacus* Perkins, *Paratridacus*, *Strumeta* and *Zeugodacus*). Hering's (1938, 1939, 1941a, 1941b, 1941c, 1953) species descriptions and key to genera were followed by Hardy (1954, 1955a, 1970) who described new species and revised species in 3 subgenera (*Afrodacus*, *Gymnodacus* and *Neodacus*) of *Dacus*. May (1962a) described 1 species from Papua New Guinea. Drew's work (1968a, 1968b, 1971, 1972a, 1972b, 1973, 1974) culminated in a new generic/subgeneric classification based on characters not previously used (shape of male surstylus and abdominal sternum V).

Scanning electron microscopy of ovipositors has enabled the identification of many sibling species complexes. These, together with new species, are described within a revised generic/subgeneric classification.

Comparative data on the African Dacinae (D.L. Hancock, Zimbabwe, pers. comm.) have provided a new understanding of the supraspecific classification and relationships of African and Pacific species.

METHODS AND ABBREVIATIONS

Ovipositors for scanning were soaked in 10% potassium hydroxide, and dehydrated in ethyl alcohol solutions of increasing concentration before critical point drying. They were then coated with platinum and examined in a Philips 505 Scanning Electron Microscope.

Many fruit flies were collected in Steiner-type fruit fly traps baited with either cue lure or methyl eugenol. This provided valuable attractant records.

Host records were obtained by placing infested fruit on trays above fine sawdust in which mature

larvae pupated. Puparia were sieved from the sawdust and held in cages. The emerging adults were fed on sugar, protein hydrolysate and water until fully coloured and then killed, pinned and labelled.

For detailed definitions of morphological characters see Drew (1982). Nomenclature has been modified to conform with McAlpine (1981). The following abbreviations have been used:

Head — i.or. = inferior fronto-orbital bristles, s.or. = superior fronto-orbital bristles.
 Thorax — mpl. = mesopleural bristles, npl. = notopleural bristles, pa. = postalar bristle, prsc. = prescutellar bristles, sa. = supra-alar bristle, sc. = scutellar bristles, scp. = scapular bristles.

Terminology of wing venation and cells is illustrated in Fig. 1.

Specimens studied have been deposited in or received on loan from many institutions whose names are abbreviated in the text as follows:

ANIC	Australian National Insect Collection, CSIRO, Canberra
APQS	Animal and Plant Quarantine Service, Guangzhou, China
BMNH	British Museum (Natural History), London, U.K.
BPBM	Bernice P. Bishop Museum, Honolulu, U.S.A.
DEI	Institut für Pflanzenschutzforschung (formerly Deutsches Entomologisches Institut), Kleinmachnow, Eberswalde, D.D.R.
DPI	Queensland Department of Primary Industries, Brisbane
DPI (PNG)	Department of Primary Industry, Port Moresby, P.N.G.
HNHM	Hungarian Natural History Museum, Budapest, Hungary
HUS	Entomological Institute, Hokkaido University, Sapporo, Japan
MNHN	Museum Nationale d'Histoire Naturelle, Paris, France
NHNV	Naturhistorisches Museum, Vienna, Austria
NMND	National Museum of Natural History, New Delhi, India
NMNH	National Museum of Natural History, Smithsonian Institution, Washington D.C., U.S.A.
NMV	Museum of Victoria, Melbourne
NSW	New South Wales Department of Agriculture, Sydney
NTU	National Taiwan University, Taipei, Taiwan

QM	Queensland Museum, Brisbane
RNH	Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands
SAM	South Australian Museum, Adelaide
UH	University of Hawaii, Honolulu, U.S.A.
UQ	University of Queensland Insect Collection, Brisbane
WEI	Wau, Ecology Institute, Wau, P.N.G.
ZMB	Zoologisches Museum Berlin, Berlin, D.D.R.
ZMC	Zoological Museum Copenhagen, Copenhagen, Denmark

GENERIC AND SUBGENERIC CLASSIFICATION

The supraspecific classification of the subfamily Dacinae has remained in an unsettled state since the first species were described. Differences of opinion have occurred as to whether the fauna should be divided into either (a) a number of genera or (b) subgenera of 2 basic genera. Perkins (1937, 1939), Hering (1941c) and May (1963) arranged species in genera. Perkins (1937) stated "the Dacinae contains so many species, is so widely distributed, and is so important, that it is necessary to divide it into clearly defined genera." However, he gave no other reasons for his classification. Although May (1963) never developed a classification, he believed that one based on subgeneric division created phylogenetic problems, because the subfamily was naturally divided into 2 groups on the basis of fusion or non-fusion of abdominal terga, i.e. an African group and an Oriental/Pacific group. Others used these taxa as subgenera of *Dacus* s.l. (e.g. Hardy, 1951; Drew, 1972a). Hardy (1951) stated "The basing of genera upon single chaetotaxic characters and upon secondary sexual characters does not appear to be a sound practice. Unless supported by other characters of generic value, these complexes should probably be considered as subgenera."

The generic/subgeneric classification of Drew (1972a) was found satisfactory in revisions of the South East Asian Dacinae by Hardy (1973, 1974). While these classifications were workable and appeared to be heading the development in the right direction, it is now necessary to revise and further develop the arrangement of species so that the 109 new species described in this monograph can be included. Consequently, the classification presented below is based on a knowledge of 290 South Pacific species and increased data on their biology (especially host plant records). It also includes information on the African fauna and the known host records of these species.

Considerable confusion remains about the

supraspecific classification of the African fauna. Munro's (1984) monograph has caused problems, especially as it is difficult to define species from this work. The raising of the Dacinae to family status and the defining of 50 genera is unsatisfactory and does not apply to the South East Asian and South Pacific fauna. Munro (1984) does not indicate how the family definition fits into the accepted classifications of the Diptera (Hennig, 1973; Colless and McAlpine, 1970). In the absence of data on the similarities to and differences from closely related families, it is difficult to accept the Dacinae at family level. As a consequence of starting with a higher taxon, Munro (1984) utilises important characters at levels above genera (subfamily and tribe) that should be used at the generic level. Consequently many characters used at the generic level, e.g. wing, leg and face colour patterns, presence or absence of yellow vittae on the mesonotum, presence or absence of yellow mesopleural stripes and yellow markings on the notopleural calli, and presence or absence of microtrichia in basal cell 2 (basal medial) of wing are, at best, only suitable in defining species. The use of secondary sex characters (pecten on male abdomen), wing and face colour patterns, to define tribes is also unsatisfactory for similar reasons. Munro also ignored characters (length of posterior surstylus lobe and concavity size on posterior margin of abdominal sternum V of male) that are important in the basic division of the Dacini (Drew, 1972a; Hardy, 1973, 1974). When the African fauna is better understood, many of his genera will be synonymised.

Hardy (1954, 1955b) classed *Callantra* as a genus on antennal size and abdominal shape. Drew (1972a) supported this and stated that in *Callantra* abdominal sterna I and II are longer than wide and that most species possess a short posterior surstylus lobe and slight concavity on the posterior margin of abdominal sternum V.

Callantra smieroides Walker, the type species of *Callantra*, has a petiolate abdomen (tergum I longer than wide) and the antennae longer than the vertical length of the head. Twenty-seven species in the South Pacific region have fused abdominal terga (28 species are listed under contents but *C. smieroides* (South East Asian) has been included because of synonymies and misidentifications with South Pacific species). Within this group there is a gradual change in abdominal shape from strongly petiolate and clubbed as in *C. smieroides*, through elongate-oval as in *Dacus armatus* Fabricius to oval as in *Dacus newmani* (Perkins). Consequently, these species cannot be grouped on abdominal shape alone. Ten

species have the antennal size as in *C. smieroides*, sa. bristles present and prsc. bristles absent (except *D. capillaris* with sa. present or absent). Of the remaining 17 species, some possess sa. and others lack them. Similar variation occurs with the prsc. bristles. All 27 species (except 3) have a slight concavity on the posterior margin of abdominal sternum V, but the posterior lobe of the male surstylus varies from short to long. Consequently any grouping on surstylus length would contain species with variable abdominal shape and antennal lengths. Likewise, any grouping on antennal size would contain species with varying abdominal shapes.

The irregular distribution of the important taxonomic characters in the 27 fused terga species, i.e. antennal length, abdominal shape, surstylus length, shape of abdominal sternum V and presence or absence of sa. and prsc. bristles, makes the generic status of *Callantra* questionable. Based on the type species (*C. smieroides*), the only characters satisfactory for separating *Callantra* are: Dacini with antennae longer than vertical length of head, and abdomen strongly petiolate (tergum I at least as long as wide). Only 9 South Pacific species available for study (specimens of *D. unicolor* were not seen) fall into this group, i.e. *D. axanus*, *D. capillaris*, *D. discors*, *D. impar*, *D. mayi*, *D. melanohumeralis*, *D. petioliforma*, *D. pusillus*, *D. solomonensis*.

Of the remaining 17 species, 9 fit in subgenus *Dacus*, 5 in subgenus *Didacus* Collart and 3 in subgenus *Semicallantra*. The most logical way to classify these species is to place all 27 in the genus *Dacus* and make *Callantra* a subgenus of *Dacus*.

The genus *Dacus* would then contain only those species with fused abdominal terga. All species with abdominal terga free would then be placed in another genus, *Bactrocera*. It is also difficult to justify the use of *Callantra* as a genus to contain only a small number of South Pacific and South East Asian species when all endemic African species (except 9) have fused abdominal terga and none fits into *Callantra* (Hancock pers. comm.).

Therefore, in this classification the tribe Dacini is split into 2 genera, *Bactrocera* and *Dacus*. Hancock (1986) also noted that the African fauna can be divided into these 2 basic groups.

This classification also has some biological significance. The South Pacific species now placed in *Callantra* breed in rainforest fruits of the family Cucurbitaceae (where the hosts are known), while the other fused terga species breed in fruits of the family Asclepiadaceae in open forests in drier habitats. The African Dacinae also breed primarily in fruits or pods of Cucurbitaceae and

Asclepiadaceae (Hancock, 1986), suggesting a relationship between the African dacine fauna and the South Pacific species with fused abdominal terga. The habitat of most African species is open woodland or savannah with only a few species occurring in rainforests (Hancock, 1986). In the South Pacific region, most species are endemic to rainforest habitats, with only the few fused abdominal terga species that breed in Asclepiadaceae occurring in the drier open forests.

In comparing the responses of African and South Pacific species to male attractants (cue lure and methyl eugenol), no African species has been recorded at methyl eugenol while most species attracted have responded to cue lure (Hancock, 1985). All Australian species with fused abdominal terga that have responded to lures have been attracted to cue lure (except *D. pusillus* which responds to methyl eugenol).

DISCUSSION OF GENERA AND SUBGENERA

Genus *Bactrocera* Macquart

Bactrocera Macquart, 1835: 452. Type species *Bactrocera longicornis* Macquart, 1835 (by monotypy).

This genus is divided into 4 groups of subgenera: *Bactrocera*, *Melanodacus*, *Queenslandacus* and *Zeugodacus* groups.

Bactrocera Group of Subgenera

Species in the *Bactrocera* group (previously called the *Strumeta* group) possess a short posterior surstylus lobe and abdominal sternum V of male deeply concave on posterior margin. Most species have an oval abdomen and 1 pair of sc. bristles, but some species of the subgenus *Polistomimetes* Enderlein have elongate-oval abdomens.

Four species possess a bulla in the wing of the male: *B. bullata* n. sp., *B. eximia* n. sp., *B. penefurva* n. sp. and *B. tigrina* (May).

Subgenus *Afrodacus* Bezzi

Afrodacus Bezzi, 1924: 469; Perkins, 1937: 55; Hardy, 1951: 117–8, 1955a: 3, 1955b: 427–8 (as subgenus of *Dacus*); May, 1963: 37–8; Drew, 1972a: 17 (as subgenus of *Dacus*). Type species *Chaetodacus biguttulus* Bezzi, 1922 (by original designation).

Eight South Pacific species are placed in this subgenus. As *B. aenigmatica* (Malloch) is only known from the type female, its placement in this subgenus is provisional. *B. aberrans* (Hardy),

previously in this subgenus, is now placed in subgenus *Javadacus* Hardy.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; sa. bristles absent; prsc. bristles present; 1 pair of sc. bristles present.

Subgenus *Bactrocera* Macquart

Bactrocera Macquart, 1835: 452; Hardy, 1976: 245–9 (as subgenus of *Dacus*); Drew et al., 1981: 54 (as subgenus of *Dacus*). Type species *Bactrocera longicornis* Macquart, 1835 (by monotypy).

Strumeta Walker, 1857: 33. Type species *Dacus conformis* Walker, 1857 = *Dacus umbrosus* Fabricius, 1805 (by original designation).

Apodacus Perkins, 1939: 26; May, 1963: 37 (syn. of *Strumeta* Walker); Drew, 1972a: 19 (syn. of *Strumeta* Walker). Type species *Apodacus cheesemani* Perkins, 1939 (by original designation).

This subgenus contains the majority of species of South Pacific Dacini. Most of these species have previously been placed in subgenus *Strumeta* Walker but Hardy (1976) showed that this is a junior synonym of *Bactrocera*. Four species placed in this subgenus are unusual in having a medial postsutural vitta: *B. cheesmanae* (Perkins), *B. eximia* n. sp., *B. neocheesmanae* n. sp. and *B. penefurva* n. sp. Reliable characters are not available to place *B. cheesmanae* (and consequently *B. neocheesmanae* n. sp.) in another subgenus (Drew 1972a). Similarly *B. eximia* n. sp. and *B. penefurva* n. sp. must be placed in this subgenus although their general appearance suggests otherwise.

Some species placed in the subgenus *Bactrocera* show variation in the presence of prsc. bristles, but because of the unreliability of this character it is unwise to establish another subgenus for these species (Drew 1972a).

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; sa. bristles present; prsc. bristles usually present; 1 pair of sc. bristles present.

Subgenus *Gymnodacus* Munro

Dacus (*Gymnodacus*) Munro, 1938: 117; Hardy, 1954: 15–16, 1955b: 430; Drew, 1972a: 18. Type species *Dacus mesomelas* Bezzi, 1908 (by original designation).

Gymnodacus Munro. May, 1963: 42.

Only 2 South Pacific species are placed in this subgenus. It is similar to subgenus *Bactrocera* and differs in the absence of a pecten of cilia on abdominal tergum III of the male.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles present; 1 pair of sc. bristles present.

Subgenus *Notodacus* Perkins

Notodacus Perkins, 1937: 56. Type species *Tephrites* (*Dacus*) *xanthodes* Broun, 1905 (by original designation).

Dacus (*Notodacus*) Perkins. Hardy, 1955b: 434; Drew, 1972a: 18–19.

Only 1 species is placed in this subgenus.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles present; prsc. and sa. bristles present; 1 pair of sc. bristles present.

Subgenus *Polistomimetes* Enderlein

Polistomimetes Enderlein, 1920: 358. Type species *Polistomimetes minax* Enderlein, 1920 (by original designation).

Daculus Speiser, 1924: 140; May, 1963: 40–1. Type species *Musca oleae* Gmelin, 1788 (by original designation).

Dacus (*Daculus*) Speiser. Hardy, 1951: 125; Drew, 1972a: 17–18 and 1979: 76 (syn.).

Dacus (*Heterodaculus*) Hardy, 1951: 134; May, 1963: 40 (syn. of *Daculus* Speiser). Type species *Dacus* (*Heterodaculus*) *visendus* Hardy, 1951 (by original designation).

Eight South Pacific species are placed in this subgenus. A trend with these species, except *B. decurtans* (May) and *B. murrayi* (Perkins), is towards an elongate-oval abdomen similar to that in the type species *B. minax* (Enderlein). It is possible that *B. decurtans* and *B. murrayi* are not true *Polistomimetes* but aberrant *Bactrocera* species with prsc. and sa. bristles absent.

Munro (1984) stated that Drew (1979) “placed the African genus *Daculus* as a synonym of *Polistomimetes* based on his having drawn up the same limited diagnosis for both without any consideration of any other characters.” However, all available characters were compared during a thorough study of *D. (Daculus) oleae* (Gmelin), the type species of *Daculus* Speiser (Drew, 1972a)

and an extensive description of *Polistomimetes minax* Enderlein, the type species of *Polistomimetes* (Drew, 1979). The latter description was based on 2 males and 1 female from the type series of *B. minax*. Munro (1984) also stated that the concavity on the posterior margin of the male abdominal sternum V is shallow in *Daculus*. In *D. oleae* (the type species) it is deep, and together with the short posterior lobe of the male surstylus and free abdominal terga, places *Daculus* and *Polistomimetes* in the same group of subgenera.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles absent; 1 pair of sc. bristles present.

Trypetidacus, n. subgen.

TYPE SPECIES: *Bactrocera invisitata*, n. sp.

This subgenus takes in 1 South Pacific species, *B. invisitata*. It is close to subgenus *Gymnodacus* in having the surstylus lobe short, abdominal sternum V with a deep concavity, pecten of cilia absent from abdominal tergum III of male and 1 pair of sc. bristles present. It differs from *Gymnodacus* in having prsc. and sa. bristles absent and is unique in possessing a short anal cell extension in the wing similar to that in the subfamily Trypetinae.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; prsc. and sa. bristles absent; 1 pair of sc. bristles present.

Melanodacus Group of Subgenera

Species in the *Melanodacus* group possess a short posterior surstylus lobe and abdominal sternum V of male slightly concave on posterior margin. All species in this group have 4 sc. bristles (as do most species in the *Zeugodacus* group of subgenera), but the male surstylus lacks the long posterior lobe present in the latter.

Hemisurstylus, n. subgen.

TYPE SPECIES: *Bactrocera melanoscutata*, n. sp.

This subgenus takes in 1 South Pacific species, *B. melanoscutata*. It differs from the other subgenera in the group in lacking prsc. bristles.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; prsc. bristles absent; sa. bristles present; 2 pairs of sc. bristles present.

Subgenus *Hemizeugodacus* Hardy

Dacus (*Hemizeugodacus*) Hardy, 1951: 131; Drew, 1972a: 18.
Type species *Dacus* (*Hemizeugodacus*) *aglaiae* Hardy, 1951 (by original designation).

Hemizeugodacus Hardy, May, 1953: 48 (as synonym of *Neozeugodacus* May).

Neozeugodacus May, 1951: 6; Hardy, 1955b: 430, 1956: 70-1 (syn.). Type species *Neozeugodacus aureus* May, 1951 (by original designation).

Three South Pacific species are placed in this subgenus. Previously it was defined as possessing a deeply concave posterior margin of abdominal sternum V of male (Drew, 1972a). Additional material of each species shows that the concavity is slight. Consequently the subgenus has been withdrawn from the *Bactrocera* group of subgenera.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. bristles present; sa. bristles absent; 2 pairs of sc. bristles present.

Subgenus *Melanodacus* Perkins

Melanodacus Perkins, 1937: 57; May, 1963: 42 (as synonym of *Paratridacus* Shiraki). Type species *Dacus niger* Tryon, 1927 (by original designation).

Dacus (*Melanodacus*) Perkins. Hardy, 1951: 138.

May (1963) made *Melanodacus* a synonym of *Paratridacus* Shiraki. A large series of specimens of the type species of *Melanodacus*, *B. nigra* (Tryon), show that the male surstylus and abdominal sternum V characters are different from those of *Paratridacus* which is now placed in the *Zeugodacus* group of subgenera. It is necessary therefore to retain *Melanodacus* for *B. nigra* and *B. satanellus* (Hering).

DEFINITION: *Bactrocera* with posterior lobe of male surstylus short; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles present; 2 pairs of sc. bristles present.

Queenslandacus Group of Subgenera

Species in the *Queenslandacus* group possess a long posterior surstylus lobe and abdominal sternum V of male with a deeply concave posterior margin.

Queenslandacus, n. subgen.

TYPE SPECIES: *Bactrocera exigua* (May).

This subgenus takes in 1 South Pacific species, *B. exigua*. Previously, specimens of this species were not available for study and consequently it was left provisionally in subgenus *Daculus* Speiser (Drew, 1972a). This species does not fit into the other 3 groups of subgenera on male surstylus and abdominal sternum V characters.

DEFINITION: *Bactrocera* with posterior lobe of male surstylus long; abdominal sternum V of male deeply concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles absent; 1 pair of sc. bristles present.

Zeugodacus Group of Subgenera

Species placed in the *Zeugodacus* group of subgenera possess a long posterior surstylus lobe and abdominal sternum V of male slightly concave on posterior margin. This group was called the *Dacus* group of subgenera (Drew, 1972a). Most species have 4 scutellar bristles.

Subgenus *Austrodacus* Perkins

Austrodacus Perkins, 1937: 56; Hardy, 1951: 122 (as subgenus of *Dacus*); May, 1963: 39; Drew, 1972a: 11 (as subgenus of *Dacus*). Type species *Dacus cucumis* French, 1907 (by original designation).

This monotypic subgenus appears to be distinct and worth retaining for *B. cucumis* (French).

DEFINITION: *Bactrocera* with posterior surstylus lobe long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles absent; 2 pairs of sc. bristles present.

Subgenus *Diplodacus* May

Diplodacus May, 1951: 8, 1953: 12, 1963: 42; Drew, 1972a: 12 (as subgenus of *Dacus*). Type species *Dacus signatifer* Tryon, 1927 (by original designation).

Dacus (*Daculus*) Speiser (partim) of Hardy, 1955b: 428.

This subgenus is monotypic for *B. signatifera* (Tryon). Although Drew (1972a) reported intraspecific variation in the number of sc. bristles in *B. signatifera*, *Diplodacus* is being retained. Munro (1984) stated that Drew (1972a) placed *Diplodacus* "as a subgenus of *Dacus* because of the very long posterior lobe of the surstylus". However, it was placed in the *Dacus* group of subgenera (now the *Zeugodacus* group of subgenera) on the combination of two characters: the length of surstylus lobe and size of concavity on posterior margin of abdominal sternum V of male. Munro also stated that Drew accepted *Diplodacus* as a genus. This is incorrect as it was accepted as a subgenus of *Dacus* (Drew, 1972a).

DEFINITION: *Bactrocera* with posterior surstylus lobe long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles absent; generally with 2 pairs of sc. bristles present.

Heminotodacus, n. subgen.

TYPE SPECIES: *Bactrocera dissidens*, n. sp.

This subgenus takes in 1 South Pacific species, *B. dissidens*. It is similar to *Papuodacus* Drew but differs in possessing 1 pair of well developed humeral bristles.

DEFINITION: *Bactrocera* with posterior surstylus lobe long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles present; prsc. bristles present; sa. bristles absent; 2 pairs of sc. bristles present.

Hemiparatridacus, n. subgen.

TYPE SPECIES: *Bactrocera abdoaurantiaca*, n. sp.

This subgenus takes in 1 South Pacific species, *B. abdoaurantiaca*. It is similar to *Paratridacus* but differs in having the prsc. bristles absent.

DEFINITION: *Bactrocera* with posterior surstylus lobe long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral and prsc. bristles absent; sa. bristles present; 2 pairs of sc. bristles present.

Subgenus Javadacus Hardy

Dacus (*Javadacus*) Hardy, 1983: 26-7. Type species *Dacus* (*Javadacus*) *montanus* Hardy, 1983 (by original designation).

This subgenus is similar to *Afrodacus* Bezzi in chaetotaxy but differs in the male surstylus and abdominal sternum V characters. It differs from *Asiadacus* Perkins in possessing prsc. bristles. *B. aberrans* (Hardy), previously placed in *Afrodacus*, fits in this subgenus.

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. bristles present; sa. bristles absent; 1 pair of sc. bristles present.

Niuginidacus, n. subgen.

TYPE SPECIES: *Bactrocera singularis*, n. sp.

This subgenus takes in 1 South Pacific species, *B. singularis*. It is similar to *Sinodacus* Zia and *Hemigymnodacus* Hardy but differs from *Sinodacus* in the absence of the abdominal pecten in males and from *Hemigymnodacus* in lacking prsc. bristles.

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral bristles absent; prsc. bristles absent; sa. bristles present; 1 pair of sc. bristles present.

Subgenus Papuodacus Drew

Dacus (*Papuodacus*) Drew, 1972a: 13. Type species *Dacus* (*Papuodacus*) *pallescentis* Drew, 1971 (by original designation).

This subgenus takes in 1 South Pacific species, *D. pallescentis* Drew, now called *Bactrocera neopallescentis* n. nom. (see discussion on *B. neopallescentis*). All the type series plus 14 of an additional 20 specimens of *B. pallescentis* possess prsc. bristles. The remaining 6 lack these bristles and fit into the monotypic subgenus *Diplodacus*. However, since *Diplodacus* is accepted above, despite intraspecific variation in the number of sc. bristles in its type species, *B. signatifera*, *Papuodacus* is similarly retained.

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. bristles generally present; sa. bristles absent; 2 pairs of sc. bristles present.

Subgenus **Paradacus** Perkins

Paradacus Perkins, 1938: 143; Hardy and Adachi, 1954: 155 (as subgenus of *Dacus*); Drew, 1972a: 13 (as subgenus of *Dacus*). Type species *Paradacus fulvipes* Perkins, 1938 (by original designation).

This subgenus is used to contain 4 South Pacific species. It is close to *Zeugodacus* Hendel, differing in the absence of prsc. bristles.

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. bristles absent; sa. bristles present; 2 pairs of sc. bristles present.

Subgenus **Paratridacus** Shiraki

Paratridacus Shiraki, 1933: 109; May, 1963: 42; Hardy, 1951: 140 (as subgenus of *Dacus*); Drew, 1972a: 15–16 (as subgenus of *Dacus*). Type species *Dacus yayeyamanus* Matsumura, 1916 (by original designation) = *Dacus expandens* Walker, 1859 (synonymised by Hardy, 1951).

Paratridacus appears to be a good subgenus, differing from *Zeugodacus* in the absence of a pecten of cilia on abdominal tergum III of males. Seven South Pacific species are placed in this subgenus.

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia absent from abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles present; 2 pairs of sc. bristles present.

Subgenus **Sinodacus** Zia

Sinodacus Zia, 1936: 157; Hardy, 1977: 47 (as subgenus of *Callantra* Walker). Type species *Sinodacus hochii* Zia, 1936 (by original designation).

Dacus (*Pacifodacus*) Drew, 1972a: 12 (new synonymy based on a comparison of type species). Type species *Asiadacus triangularis* Drew, 1968 (by original designation).

Pacifodacus Drew, established for a group of South Pacific species previously placed in

Asiadacus Perkins and *Neodacus* Perkins (Drew, 1972a), cannot be separated generically from specimens of *S. hochii* Zia, the type species of *Sinodacus*, kindly donated by Liang Guang-qin, APQS.

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. bristles absent; sa. bristles present; 1 pair of sc. bristles present.

Subgenus **Zeugodacus** Hendel

Dacus (*Zeugodacus*) Hendel, 1927a: 26; Hardy, 1955b: 436–7; Drew, 1972a: 16. Type species *Dacus caudatus* Fabricius, 1805 (by original designation).

Zeugodacus Hendel. Shiraki, 1933: 78; Perkins, 1937: 55, 1938: 137; May, 1963: 50.

Zeugodacus is a large subgenus in the South Pacific region, containing 20 species. *B. fulvifacies* (Perkins) and *B. terminifera* (Walker) are placed provisionally in this subgenus (Drew, 1972a).

DEFINITION: *Bactrocera* with posterior lobe of surstylus long; abdominal sternum V of male slightly concave on posterior margin; pecten of cilia present on abdominal tergum III of male; humeral bristles absent; prsc. and sa. bristles present; generally with 2 pairs of sc. bristles present.

Genus **Dacus** Fabricius

Dacus Fabricius, 1805: 272. Type species *Dacus armatus* Fabricius, 1805 (by subsequent designation of Speiser, 1924: 140 and confirmed by Hendel, 1927a: 25).

Subgenus **Callantra** Walker

Callantra Walker, 1860: 153; Hendel, 1914: 74 (as *Calantra*, lapsus); Hardy and Adachi, 1954: 149; Hardy, 1955b: 426–7; May, 1963: 40; Drew, 1972a: 9. Type species *Callantra smieroides* Walker, 1860 (by monotypy). *Mellesis* Bezzi, 1916: 114; Hendel, 1927b: 58 (syn.). Type species *Monacrostichus crabroniformis* Bezzi, 1914 (by original designation).

As specimens of *D. unicolor* (Hendel) were not available for study, it is only provisionally placed in this subgenus. The placing of such species in Callantrinae by Munro (1984) on the basis of abdominal shape is unacceptable for the South Pacific fauna. The gradual change in abdominal shape from oval to strongly petiolate prevents the establishment of a line of demarcation that would

allow a group of species to be placed in taxa as high as genera and subfamily.

DEFINITION: *Dacus* with abdominal sternum V of male slightly concave on posterior margin; prsc. bristles absent; antennae longer than vertical length of head; abdomen strongly petiolate (tergum I at least as long as wide).

Subgenus *Dacus* Fabricius

Dacus Fabricius, 1805: 272; Hardy, 1955b: 428 (as subgenus); Drew, 1972a: 11–12 and 1979: 72 (as subgenus). Type species *Dacus armatus* Fabricius, 1805 (by subsequent designation of Speiser, 1924: 140).

Tridacus Bezzi, 1915: 86; Hendel, 1927a: 24 (syn.). Type species *Dacus armatus* Fabricius, 1805 (by subsequent designation of Collart, 1935: 9).

Neodacus Perkins, 1937: 58; May, 1963: 41–2 (syn.). Type species *Neodacus newmani* Perkins, 1937 (by monotypy).

The holotype of the type species, *D. armatus*, was described and illustrated by Drew (1979). The following definition is based on that study and other specimens of *D. armatus*.

DEFINITION: *Dacus* with abdominal sternum V of male slightly concave on posterior margin; prsc. bristles absent; antennae equal to or less than vertical length of head; abdomen elongate-oval (tergum I wider than long); sa. bristles present.

Subgenus *Didacus* Collart

Dacus (*Didacus*) Collart, 1935: 33; Drew, 1979: 74. Type species *Dacus* (*Didacus*) *ciliatus* Loew, 1862 (by original designation).

Characters from the type species, *D. ciliatus* Loew, were recorded by Drew (1979).

DEFINITION: *Dacus* with abdominal sternum V of male slightly concave on posterior margin; prsc. bristles absent; antennae equal to or less than vertical length of head; abdomen elongate-oval (tergum I wider than long); sa. bristles absent.

Semicallantry, n. subgen.

TYPE SPECIES: *Dacus aquilus*, n. sp.

This subgenus takes in 3 new South Pacific species.

DEFINITION: *Dacus* with abdominal sternum V of male deeply concave on posterior margin; prsc. bristles present.

Genus *Paracallantry* Hendel

Paracallantry Hendel, 1927b: 59; Drew, 1972a: 20. Type species *Paracallantry vespiformis* Hendel, 1927 (by original designation).

Dacus (*Paracallantry*) Hendel. Hardy, 1955b: 434.

The holotype of the type species of this monotypic genus has been lost (Drew, 1972a) and despite intensive collecting in New Britain (the type locality) no further specimens have been collected. Although the original description is vague, *P. vespiformis* may be synonymous with *D. (Callantry) axanus* (Hering), a common species in New Britain.

KEY TO GENERA AND SUBGENERA OF SOUTH PACIFIC DACINAE

1. Abdominal terga fused (Genus *Dacus* Fabricius) 2
- Abdominal terga not fused (Genus *Bactrocera* Macquart) 5
- 2(1). Abdominal sternum V of male with a deep concavity on posterior margin; prescutellar bristles present *Semicallantry*; n. subgen.
- Abdominal sternum V of male with a slight concavity on posterior margin; prescutellar bristles absent 3
- 3(2). Combined lengths of all antennal segments greater than vertical length of head; abdomen strongly petiolate (tergum I length greater than or equal to width) Subgenus *Callantry* Walker
- Combined lengths of all antennal segments equal to or less than vertical length of head; abdomen elongate-oval (tergum I length less than width) 4
- 4(3). Supra-alar bristles present Subgenus *Dacus* Fabricius
- Supra-alar bristles absent Subgenus *Didacus* Collart
- 5(1). Posterior surstylus lobe short (at most twice as long as anterior lobe) 6
- Posterior surstylus lobe long (at least 6 times as long as anterior lobe) 14

6(5).	Abdominal sternum V of male with a deep concavity on posterior margin (<i>Bactrocera</i> Group of Subgenera)	7
	Abdominal sternum V of male with a slight concavity on posterior margin (<i>Melanodacus</i> Group of Subgenera)	12
7(6).	Pecten on abdominal tergum III of male absent	8
	Pecten on abdominal tergum III of male present	9
8(7).	Prescutellar and supra-alar bristles absent	<i>Trypetidacus</i> , n. subgen.
	Prescutellar and supra-alar bristles present	Subgenus <i>Gymnodacus</i> Munro
9(7).	Humeral bristles present	Subgenus <i>Notodacus</i> Perkins
	Humeral bristles absent	10
10(9).	Supra-alar bristles present	Subgenus <i>Bactrocera</i> Macquart
	Supra-alar bristles absent	11
11(10).	Prescutellar bristles present	Subgenus <i>Afrodacus</i> Bezzi
	Prescutellar bristles absent	Subgenus <i>Polistomimetes</i> Enderlein
12(6).	Prescutellar bristles absent	<i>Hemisurstylus</i> , n. subgen.
	Prescutellar bristles present	13
13(12).	Pecten on abdominal tergum III of male present	Subgenus <i>Hemizeugodacus</i> Hardy
	Pecten on abdominal tergum III of male absent	Subgenus <i>Melanodacus</i> Perkins
14(5).	Abdominal sternum V of male with a deep concavity on posterior margin	<i>Queenslandacus</i> , n. subgen.
	Abdominal sternum V of male with a slight concavity on posterior margin (<i>Zeugodacus</i> Group of Subgenera)	15
15(14).	1 pair of scutellar bristles present	16
	2 pairs of scutellar bristles present	19
16(15).	Supra-alar bristles absent	Subgenus <i>Javadacus</i> Hardy
	Supra-alar bristles present	17
17(16).	Pecten on abdominal tergum III of male present	18
	Pecten on abdominal tergum III of male absent	<i>Niuginidacus</i> , n. subgen.
18(17).	Prescutellar bristles absent	Subgenus <i>Sinodacus</i> Zia
	Prescutellar bristles present (some specimens of <i>B. cucurbitae</i> only)	Subgenus <i>Zeugodacus</i> Hendel
19(15).	Pecten on abdominal tergum III of male absent	20
	Pecten on abdominal tergum III of male present	22
20(19).	Supra-alar bristles absent	Subgenus <i>Austrodacus</i> Perkins
	Supra-alar bristles present	21
21(20).	Prescutellar bristles present	Subgenus <i>Paratridacus</i> Shiraki
	Prescutellar bristles absent	<i>Hemiparatridacus</i> , n. subgen.
22(19).	Supra-alar bristles absent	23
	Supra-alar bristles present	25
23(22).	Prescutellar bristles absent	Subgenus <i>Diplodacus</i> May
	Prescutellar bristles present	24
24(23).	Humeral bristles present	<i>Heminotodacus</i> , n. subgen.
	Humeral bristles absent	Subgenus <i>Papuodacus</i> Drew
25(22).	Prescutellar bristles absent	Subgenus <i>Paradacus</i> Perkins
	Prescutellar bristles present	Subgenus <i>Zeugodacus</i> Hendel

DESCRIPTIONS AND KEYS

Some characters used in the subgeneric classification of genus *Bactrocera* only apply to males. Consequently females cannot be identified to subgenera and keys to species within each subgenus could only be used when males are available. In order to identify females, and specimens belonging to monotypic subgenera, a

key to species within the genus *Bactrocera* is provided while keys to species within each subgenus are not included. In this key, no species is identified solely on characters applicable to one sex, except in the case of *B. calophylli* which in couplet 126, can only be separated on the absence of a pecten of cilia on abdominal tergum III of the male.

For some species, holotypes have not been

recorded as studied under material examined. In such cases, the holotypes were studied for earlier publications by the author (Drew 1973, 1974a). The location of types for species listed as synonyms is recorded where this information is known. Lectotypes have been designated for species where the designation of a holotype is uncertain (see Articles 72b (vii) and 74a of the International Code of Zoological Nomenclature).

Genus *Bactrocera* Macquart

Bactrocera Group of Subgenera

Subgenus *Afrodacus* Bezzi

Bactrocera (*Afrodacus*) *aenigmatica* (Malloch), n. comb. (Fig. 2)

Dacus aenigmaticus Malloch, 1931: 261–2.

Dacus (*Afrodacus*) *aenigmaticus*: Hardy, 1955a: 6; Drew, 1974a: 2–3.

MATERIAL EXAMINED

Holotype ♀.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Malololelei, Western Samoa (type locality).

DIAGNOSIS

Small species; humeral calli yellow; notopleural calli orange-brown; mesonotum shiny orange-brown with a narrow medial longitudinal black vitta, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural yellow vitta absent, scutellum orange-brown; wing with a narrow fuscous costal band and pale fulvous anal cell, costal cells colourless, microtrichia covering most of second costal cell only; abdominal terga III–V shining orange-brown with a medial and 2 broad lateral longitudinal shining black bands.

ATTRACTANT: No known record.

COMMENTS

This species was described adequately by Drew (1974a). It is similar to *B. jarvisi* (Tryon) and *B. ochracea* in possessing a pale coloured mesonotum, a uniformly coloured scutellum and lacking infuscation around r–m crossvein. It is distinct from these species in possessing a medial longitudinal black vitta on the mesonotum, notopleural calli orange-brown and abdominal terga III–V shining orange-brown with a medial and 2 broad lateral shining black bands.

Bactrocera (*Afrodacus*) *brunnea* (Perkins and May), n. comb. (Figs 3–5)

Afrodacus brunneus Perkins and May, 1949: 18–21.

Dacus (*Afrodacus*) *brunneus*: Hardy, 1951: 118.

Afrodacus brunneus: May, 1963: 49.

MATERIAL EXAMINED

AUSTRALIA, south-east Queensland: lectotype ♀, Gayndah, November 1945, A.W.S. May and 1 ♂ (T.5260), Toowoomba, December 1937, H. Jarvis (in QM); paralectotype ♀ labelled “Stanthorpe, Q., 24.i.1925, traps”; a series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: Lectotype (T.5261) and paralectotype (T.10601) in QM.

DISTRIBUTION

Known throughout south-east Queensland as far west as Stanthorpe and Toowoomba; type locality, Gayndah. It has been collected in north Queensland at higher altitudes on the Atherton Tableland.

DIAGNOSIS

Medium sized species; medium sized pale facial spots present; humeral calli yellow; notopleural calli red-brown, mesonotum red-brown, broad mesopleural stripe reaching humeral callus, narrow lateral postsutural vittae ending before upper pa. bristle, medial postsutural vitta absent, scutellum yellow except fuscous on apical ½; wing with a narrow fuscous costal band expanding at apex, a narrow fuscous band along r–m crossvein, a broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a broad fuscous margin on tergum III and narrow pale fuscous margins on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons narrowing slightly posteriorly, length 1.78 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with small oval fuscous spots; length of face 0.45 mm. Genae fulvous, dark subocular spot absent; fulvous bristle present. Occiput red-brown, yellow along eye margins; occipital row with 2–4 strong black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong dark fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.25 mm; 0.58 mm.

Thorax mesonotum red-brown with a mottled appearance due to sites of attachment of dorsoventral flight muscles. Pleural areas red-brown with fuscous on sternopleuron. Yellow markings as follows: humeral calli; broad mesopleural stripe, reaching humeral callus dorsally, not continuing to sternopleuron, anterior margin deeply concave; upper hypopleural calli (posterior apices dark fuscous); anterior 3/5 lower hypopleural calli (remainder dark fuscous); 2 narrow parallel sided lateral postsutural vittae ending before upper pa. bristles. Notopleural calli red-brown. Medial postsutural vittae absent. Scutellum yellow except fuscous on apical 1/2. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except darker fulvous on apex of fore femora, pale fuscous on apex of mid femora, fuscous on apex of hind femora and dark fuscous hind tibiae; mid tibiae each with an apical black spur.

Wings length 5.5 mm; costal cells fulvous (second cell paler apically); microtrichia in outer corner of second costal cell only; remainder of wing colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and expanding in apex of wing to end between extremities of R_{4+5} and M, a fuscous band around r-m cross-vein, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous; tergum II orange-brown with a broad transverse fuscous band across anterior 1/3 and widening to cover lateral margins; terga III-V orange-brown with broad fuscous margins on tergum III which continue along anterior margin of tergum, narrower pale fuscous lateral margins on terga IV and V. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, elongate and almost circular in transverse cross section. Ratio of length of ov scape to length of tergum V 1.52:1. Apex of piercer with 3 pairs of subapical keels and 2 pairs of small subapical bristles (Fig. 4). Spicules at distal end of middle segment sparse,

triangular and elongate in shape, without dentations (Fig. 5).

ATTRACTANT: No known record.

COMMENTS

B. brunnea is similar to *B. aenigmatica* (Malloch), *B. jarvisi* (Tryon) and *B. ochracea* in possessing a pale coloured mesonotum but differs in having the apical 1/2 of the scutellum fuscous and infuscation surrounding r-m crossvein. Originally, Perkins and May (1949) described the costal band as not reaching extremity of R_{4+5} ; it actually overlaps R_{4+5} , reaching just beyond the end of M. The authors described the species "from 2 females and 1 male trapped at Gayndah and Stanthorpe in a citrus and deciduous fruit orchard respectively", but designated no types. Two specimens each labelled holotype are in QM, a female (T.5261) labelled Gayndah, November 1945, A.W.S. May and a male labelled Toowoomba, December 1937, H. Jarvis. Another female found in DPI is labelled "Stanthorpe, Q., 24.i.1925, traps". The specimens from Gayndah and Stanthorpe are part of the type series, but the male labelled holotype cannot be confirmed as a type as no specimen from Toowoomba was mentioned in the original description. The third type could not be located although the male from Toowoomba may be the specimen. I designate the female from Gayndah as lectotype and the female from Stanthorpe as paralectotype.

Bactrocera (Afrodacus) hypomelaina, n. sp. (Fig. 6)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 28.iii.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, 1 ♂ (20.iii.1980) and 1 ♂ (1.iv.1980), attracted to cue lure, P. Daur; Mt Missim (1200–1700 m) — 2 ♂♂ (6.xi.1980), 1 ♂ (11.xi.1980), 1 ♂ (13.xi.1980), 1 ♂ (18.xii.1980), 1 ♂ (25.xii.1980), 1 ♂ (8.i.1981), 1 ♂ (19.i.1981), 3 ♂♂ (5.ii.1981), 2 ♂♂ (21.v.1981), 2 ♂♂ (4.vi.1981), all attracted to cue lure, A. Allison; Mt Kaindi — 1 ♂ (1600 m), 15.xii.1980 and 1 ♂ (2150 m), 18.xi.1980, attracted to cue lure, A. Allison. Western Highlands Province: 1 ♂, Mt Hagen, attracted to cue lure, 23.xii.1980, B. Thistleton.

LOCATION OF TYPES: Holotype (T.10470) and 1 paratype (T.10471) in QM; 4 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI (PNG); 13 paratypes in DPI.

DISTRIBUTION

Known from the Morobe and Western Highlands Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous without facial spots; humeral calli black; notopleural calli yellow; mesonotum black, lateral and medial postsutural vittae absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow with a broad medial longitudinal black band; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdomen black except paler on posterior ½ of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.5 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered by short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with no dark spots; length of face 0.5 mm. Genae fulvous, pale subocular spot present; red-brown bristle present. Occiput black, fulvous along eye margins; occipital row with 2–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except dark fuscous on apex and outer surface; a small fuscous dorsal bristle on segment 2; arista black (fuscous basally); length of segments: 0.20 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum and pleural areas black. Yellow markings as follows: notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin irregular; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder including broad ventral margin black). Humeral calli black. Lateral and medial postsutural vittae absent. Postnotum black. Scutellum yellow except for a broad medial longitudinal black band and a large fuscous spot on apex. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4–6; all bristles well developed and black.

Legs fore and mid coxae fuscous, hind coxae dark fuscous; all other segments fulvous except dark fuscous on apices of hind femora and hind tibiae (remainder of hind tibiae black), fuscous on basal areas of fore and mid tibiae and on apical 4 segments of fore tarsi; mid tibiae each with an apical black spur.

Wings length 6.3 mm; costal cells with a pale

fuscous tint, microtrichia in outer corner of second costal cell only; remainder of wings colourless except for a dark fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and beyond extremity of R_{2+3} it narrows to a fine fuscous line around costal margin to end between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V black except for a pair of oval shining spots on tergum V which are dark fuscous anteriorly and red-brown posteriorly and a narrow dark fuscous band along posterior margin of tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. hypomelaina is similar to *B. minuta* (Drew) and *B. tigrina* (May) in possessing a black mesonotum but is distinct from these species in having a broad medial longitudinal black band on dorsal surface of scutellum, abdominal terga uniformly black and costal cells with a pale fuscous tint.

Bactrocera (Afrodacus) jarvisi
(Tryon), n. comb. (Figs 7–9)

Chaetodacus jarvisi Tryon, 1927: 201–3.

Chaetodacus jarvisi var. *careya* Tryon, 1927: 202 (nomen nudum).

Dacus (Chaetodacus) australis Hendel, 1928: 341–2.

Dacus (Chaetodacus) australis var. *halterata* Hendel, 1928: 342–3.

Dacus (Afrodacus) jarvisi: Hardy, 1951: 120–1.

Afrodacus jarvisi: May, 1963: 38, 49.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: *C. jarvisi*, holotype ♀ (D.3131) and syntypes of var. *careya* (1 ♀ and 1 ♂, D.3132) in QM; *D. australis*, 7 syntypes (both sexes) in DEI; *D. australis* var. *halterata*, holotype ♀ in DEI.

DISTRIBUTION

PREVIOUSLY RECORDED: Occurs in large populations throughout most of its range. It has been recorded across northern Australia from Broome in Western Australia to eastern Arnhem Land and along the eastern coast (type locality, Stanthorpe) from Cape York in Queensland to the

Sydney area of New South Wales. Also recorded from the following Torres Strait islands: Badu, Darnley, Horn, Thursday and Yorke.

NEW RECORDS: Torres Strait islands: Prince of Wales, Saibai, Yam (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized irregularly oval black facial spots present; humeral and notopleural calli yellow and connected by a broad yellow band; mesonotum red-brown, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vittae absent, wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a fuscous to black transverse band across anterior margin of tergum III and a fuscous to black medial longitudinal band generally over all 3 terga but often variable.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.52 times breadth; fulvous with pale fuscous on anteromedial hump and occasionally around s.or. bristles; anteromedial hump covered with a small number of short pale setae; orbital bristles weak and black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized irregularly oval black spots; length of face 0.48 mm. Genae fulvous without subocular dark spot; pale fulvous bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with pale fuscous on apex and outer surface; a weak fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.28 mm; 0.70 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; broad band connecting humeral and notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices dark red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark red-brown); 2 broad parallel sided lateral postsutural vittae ending posterior to upper pa. bristles. Medial postsutural vittae absent. Postnotum dark red-brown. Scutellum yellow except for narrow red-

brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments including coxae fulvous; mid tibiae each with an apical black spur.

Wings length 5.9 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with or just overlapping R_{2+3} and expanding into a broad band apically to end between extremities of R_{4+5} and M, a broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fulvous; tergum II fulvous except for a narrow transverse pale fuscous band across anterior margin but not reaching lateral margins; terga III–V orange-brown except for a narrow transverse fuscous to black band along anterior margin of tergum III (not reaching lateral margins in some specimens) and a narrow medial longitudinal fuscous to black band over terga III–V (this band varies in colour and continuity and often exists only as a spot on terga IV and V). A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, elliptical in transverse cross section. Ratio of length of ov scape to length of tergum V 1.2:1. Apex of piercer broadly rounded with 4 pairs of subapical bristles (Fig. 8). Spicules at distal end of middle segment very wide with approximately 8 long narrow dentations (Fig. 9).

HOST PLANTS

NEW RECORDS: *Planchonella* sp. (Sapotaceae), Cairns, north Queensland, 6.i.1977, B. McCulloch; *Notalaea* sp. (Oleaceae), Somerset road (23 km north of Bamaga) Cape York, Queensland, 19.xii.1974, D.J. Rogers, in association with *B. kraussi* (Hardy) and *B. neohumeralis* (Hardy); *Aglaia sapindina* (Meliaceae), Cairns, north Queensland, Jan. 1977, B. McCulloch; ripe cavendish bananas (*Musa* sp.), Kamerunga Horticulture Research Station, near Cairns, March 1985, R. Drew (5 specimens in association with approximately 2000 *B. musae* (Tryon), banana fruit

fly); *Terminalia melanocarpa* (Combretaceae), Trinity Beach, G. Fitt, in association with *B. neohumeralis* (Hardy); *Syzygium rubrimolle* (Myrtaceae) (red lady apple), various localities between Bamaga and Somerset, Cape York, December 1974, D.J. Rogers.

ATTRACTANT: Weak attractancy to cue lure in north-west Western Australia.

COMMENTS

B. jarvisi is similar to *B. ochracea* in having a pale coloured mesonotum, yellow notopleural calli and abdominal terga III–V without dark lateral margins. It is distinct from this species in having a broad yellow band connecting humeral and notopleural calli, colourless costal cells with microtrichia in outer corner of second costal cell only, costal band expanded slightly at apex of wing and abdominal terga III–V with a fuscous to black narrow band across base of tergum III and a medial longitudinal fuscous to black band over all 3 terga.

In the original description, Tryon (1927) indicated a variety *careya* but did not distinguish it from *jarvisi* except by host data. Therefore the name is unavailable (Article 12c of the International Code of Zoological Nomenclature).

Bactrocera (Afrodacus) minuta (Drew), n. comb. (Fig. 10)

Dacus (Afrodacus) minutus Drew, 1971: 29–31.

MATERIAL EXAMINED

A large series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6927) in QM.

DISTRIBUTION

Known only from Vanuatu (formerly New Hebrides), type locality, Vila, Efate I.

DIAGNOSIS

Small species; facial spots absent; humeral calli fuscous to black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; all abdominal terga orange-brown except for a narrow fuscous medial longitudinal band over terga IV and V.

ATTRACTANT: Cue lure.

COMMENTS

This species was described adequately by Drew

(1971). It is similar to *B. hypomelaina* in having lateral and medial postsutural vittae absent and humeral calli fuscous to black but differs in having the scutellum entirely yellow, costal cells colourless and the abdominal terga uniformly orange-brown with a narrow medial longitudinal fuscous band on terga IV and V.

***Bactrocera (Afrodacus) ochracea*, n. sp.** (Fig. 11)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central District: Mt Lawes (800 feet), attracted to cue lure, 9–13.iii.1970, T.L. Fenner.

Paratypes, PAPUA NEW GUINEA, Central District: 13 ♂♂, Mt Lawes (800 feet), attracted to cue lure, 9–13.iii.1970, T.L. Fenner.

LOCATION OF TYPES: Holotype (T.10472) and 1 paratype (T.10473) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 8 paratypes in DPI.

DISTRIBUTION

Known only from Mt Lawes, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with black spots present; humeral and notopleural calli yellow, mesonotum orange-brown with irregular fuscous markings, lateral postsutural vittae present, mesopleural stripe broad reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells pale fuscous, microtrichia covering second costal cell and outer ½ of first costal cell; abdominal terga III–V orange-brown with a diffuse darker orange-brown medial longitudinal band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons narrowing slightly posteriorly, length 1.68 times breadth; fulvous without dark markings; anteromedial hump with a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots present; length of face 0.45 mm. Genae fulvous, dark subocular spot absent; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with all segments fulvous except pale fuscous on apex and outer surface; a small pale dorsal bristle on segment 2; arista red-brown (fulvous basally);

length of segments: 0.16 mm; 0.25 mm; 0.78 mm.

Thorax mesonotum orange-brown with irregular fuscous markings at sites of attachment of dorsoventral flight muscles. Pleural areas red-brown to pale fuscous. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; 2 moderately broad lateral postsutural vittae narrowing slightly posteriorly to end at the upper pa. bristles; upper hypopleural calli (posterior apices pale fuscous); anterior 3/5 lower hypopleural calli (remainder pale fuscous). Postnotum red-brown. Scutellum yellow except for narrow orange-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 3-5; all bristles red-brown and not generally well developed.

Legs all segments fulvous; mid tibiae each with an apical fuscous spur; fore femora with rows of long pale setae on dorsal surface.

Wings length 5.4 mm; costal cells pale fuscous, microtrichia covering second costal cell and outer 1/2 of first costal cell; remainder of wings colourless except for a fuscous subcostal cell, narrow fuscous costal band overlapping R₂₊₃ and ending between extremities of R₄₊₅ and M, a narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II slightly wider than long; sternum II with a deep concavity on anterior margin. Tergum I orange-brown, tending fuscous laterally. Tergum II orange-brown, tending whitish posteriorly. Terga III-V orange-brown with an indication of a darker orange-brown medial longitudinal band over all 3 terga. A pair of oval shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. ochracea is similar to *B. jarvisi* (Tryon) in possessing a pale mesonotum, yellow notopleural calli and abdominal terga III-V without dark lateral margins but differs in having the humeral and notopleural calli not joined by a yellow band, costal band of uniform width throughout, costal cells pale fuscous with microtrichia covering all of second costal cell and outer 1/2 of first costal cell, abdominal terga without dark colour patterns.

Bactrocera (Afrodacus) tigrina (May), n. comb. (Figs 12-15)

Afrodacus tigrinus May, 1952: 339-41, 1957b: 296-7, 1963: 37-8, 49.

Afrodacus flavinotus May, 1957b: 293-4. New synonymy based on study of holotypes of *A. flavinotus* and *A. tigrinus*.

Afrodacus furvus May, 1957b: 294-6, 1963: 38, 49. New synonymy based on study of holotypes of *A. furvus* and *A. tigrinus* and a series of specimens of *A. tigrinus*.

MATERIAL EXAMINED

AUSTRALIA, Queensland: 2 ♀♀ (23.xii.1976) and 1 ♀ (2.ii.1977), Lake Placid, collected at protein hydrolysate lure, B.C. McCulloch; 1 ♀ (13.i.1956), Cairns, A.W.S. May; 4 ♂♂ and 4 ♀♀, 11 km ENE of Mt Tozer, Cape York, attracted to light trap, 11-16 July 1986, D.H. Colless; specimens in DPI; type specimens of *A. tigrinus*, *A. flavinotus* and *A. furvus*. LOCATION OF TYPES: *A. tigrinus*, holotype ♀ (T.5274), paratype ♀ and allotype ♂ (T.5604) in QM; *A. flavinotus*, holotype ♀ (T.5603) in QM; *A. furvus*, holotype ♂ (T.5605) and allotype ♀ (T.5606) in QM.

DISTRIBUTION

Known from the Cairns district (type locality, Kamerunga), Atherton Tableland and Mt Tozer, north Queensland.

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow (except posterodorsal corners black in male); notopleural calli with anterior 1/2 brown and posterior 1/2 yellow; mesonotum black, lateral and medial postsutural vittae present, mesopleural stripe broad extending to humeral callus, scutellum yellow; wing of female with a narrow fuscous costal band expanding slightly in apex of wing and a broad fuscous anal streak, wing of male with the costal band ending at extremity of R₁ and a large fuscous spot in wing apex and anal streak absent, costal cells fuscous with microtrichia covering second costal cell and outer 1/2 of first costal cell of female and both costal cells in male; abdominal terga III-V of female orange-brown with a narrow transverse black band across base of tergum III, 2 narrow lateral longitudinal black bands over all 3 terga and a narrow medial longitudinal black band on terga IV and V, abdominal terga III-V of male orange-brown except for 2 lateral longitudinal black bands over all 3 terga and a medial longitudinal black band over terga IV and V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.03 mm. Frons of even width, length 1.31 times breadth; fulvous without dark markings;

anteromedial hump covered by a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark spots; length of face 0.33 mm. Genae fulvous, dark subocular spot absent; red-brown bristle present. Occiput fulvous with dark fuscous markings laterally and yellow along eye margins; occipital row with a large number of very small pale bristles. Antennae with all segments fulvous; a very weak pale dorsal bristle on segment 2; arista red-brown; length of segments: 0.10 mm; 0.18 mm; 0.40 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, along mesonotal suture and between humeral and notopleural calli. Pleural areas black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; posterior $\frac{1}{2}$ of notopleural calli (remainder brown); broad mesopleural stripe reaching humeral callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae ending behind upper pa. bristles; a short but broad medial postsutural vitta which begins at the posterior margin of the mesonotum and narrows to a point in the centre of the mesonotum. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments including coxae fulvous except hind tibiae very pale fuscous; mid tibiae each with an apical black spur.

Wings length 4.2 mm; costal cells fuscous; microtrichia covering second costal cell and outer $\frac{1}{2}$ of first costal cell; remainder of wing with a pale fuscous tint, except fuscous subcostal cell, narrow fuscous costal band confluent with R_{4+5} except in centre of wing where it is confluent with R_{2+3} and broadening in apex of wing to end at extremity of M, broad pale fuscous anal streak merging into a pale tint in the wing membrane; dense aggregation of microtrichia around $A_1 + CuA_2$ absent; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I orange-brown; tergum II orange-brown with a narrow transverse black band across anterior margin but not reaching lateral margins; terga III–V orange-brown with a narrow transverse black band across anterior margin of tergum III, narrow lateral longitudinal black bands over all 3 terga (but not confluent with lateral margins of

terga III and IV) and a narrow medial longitudinal black band on terga IV and/or V. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor red-brown, dorsoventrally compressed and narrowing posteriorly in dorsal view; ratio of length of oviscapae to length of tergum V 0.69:1; apex of piercer with 2 lateral keels midway between bristles and gonopore and with 3 pairs of small subapical bristles (Fig. 14). Spicules at distal end of middle segment of medium width with a row of 7–10 dentations of approximately equal size. (Fig. 15).

MALE: Head generally fulvous. Vertical length 1.1 mm. Frons narrowing slightly posteriorly, length 1.4 times breadth; fulvous with fuscous around s.or. bristles; anteromedial hump with a few short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark facial spots; length of face 0.3 mm. Genae fulvous, subocular spot absent; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of very small pale bristles. Antennae with all segments fulvous; arista black (fulvous basally); length of segments: 0.10 mm; 0.15 mm; 0.32 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, along mesonotal suture and between humeral and notopleural calli. Pleural areas dark fuscous to black except fulvous above mid coxae and below humeral calli. Yellow markings as follows: humeral calli (posterodorsal corners black); posterior $\frac{1}{2}$ notopleural calli (remainder brown); broad mesopleural stripe reaching humeral callus dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae ending behind upper pa. bristles; a broad, short, medial postsutural vitta broadly rounded posteriorly and narrowing sharply anteriorly to end in a point at centre of mesonotum. Postnotum black. Scutellum yellow except for narrow black basal band which widens slightly laterally. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous; rows of long pale setae on ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 3.8 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with M and ending at extremity of R_1 , a large fuscous spot at apex of wing; anal streak absent; dense aggregation

of microtrichia around $A_1 + CuA_2$; supernumerary lobe large; a large well developed bulla over anal cell extension.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I orange-brown except for 2 anterolateral fuscous spots; tergum II orange-brown except for 2 large lateral black spots; terga III–V orange-brown except for large black spots on lateral margins and a medial longitudinal black band over terga IV and V (this band consists of 2 elongate spots which are broad on the posterior margin of each tergum and narrowed to a point on the anterior margin). Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

The specimens of *B. tigrina* listed above as collected at light trap, reveal a marked sexual dimorphism in important taxonomic characters. This is unique in the Dacinae. Consequently, having described *A. tigrinus* from a female (May, 1952), he described *A. furvus* from a male (May, 1957b) now known to be *B. tigrina*. Originally the notopleural calli were described as yellow — the correct description is anterior $\frac{1}{2}$ fuscous, posterior $\frac{1}{2}$ yellow.

May (1952) designated a female holotype and 1 female paratype for *A. tigrinus*. A male labelled allotype in QM designated by May (1957b) cannot be a type as it was not part of the original type series.

Subgenus *Bactrocera* Macquart

SPECIES PLACED IN COMPLEXES

aemula complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for narrow costal band (not confluent with R_{4+5}) and anal streak, costal cells colourless or with a pale tint and without microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with narrow dark basal band, mesonotum black (or with a distinct black lanceolate pattern), abdominal terga III–V with a medial longitudinal dark band and variable dark patterns on lateral margins, males attracted to cue lure.

Bactrocera (Bactrocera) aemula, n. sp. (Fig. 16)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Western Highlands Province: Mt Hagen, attracted to cue lure, 24.iii.1981, B. Thistleton.

LOCATION OF TYPE: Holotype (T.10474) in QM.

DISTRIBUTION

Known only from Mt Hagen, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized rectangular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells very pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga III–V dark (III—black, IV—dark fuscous to black, V—fuscous) except fuscous posterocentrally on IV and red-brown posterocentrally on V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.9 mm. Frons narrowing slightly posteriorly, length 1.56 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized rectangular spots; length of face 0.60 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.35 mm; 0.98 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, along mesonotal suture, above notopleural suture and inside humeral calli. Pleural areas black except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron

as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{1}{2}$ lower hypopleural calli (remainder including ventral margin black); 2 very broad lateral postsutural vittae narrowing sharply posteriorly to end well before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except apical $\frac{1}{3}$ of all femora pale fuscous, fore tibiae pale fuscous and hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.5 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except fuscous lateral margins and a narrow transverse black band across centre of tergum and ending before lateral margins; tergum III black; tergum IV dark fuscous to black except small fuscous areas each side of a broad medial longitudinal black band; tergum V red-brown except anterolateral corners fuscous and a broad medial longitudinal black band, a pair of red-brown shining spots present. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. aemula is similar to *B. mimulus* (dorsalis complex) in having the costal band overlapping R_{2+3} , mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle and costal cells with a pale fulvous tint. It differs from this species in possessing a narrower costal band which does not extend close to R_{4+5} .

***Bactrocera* (*Bactrocera*) *consectorata*, n. sp** (Fig. 17)

TYPE SPECIMENS

Holotype σ , PAPUA NEW GUINEA, Morobe Province:

Upper Stony logging area, Bulolo, attracted to cue lure, 4.iii.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 2 σ (18.ii.1980) and 2 σ (4.iii.1980), Upper Stony logging area, Bulolo, P. Daur; 4 σ (22.vi.1980), Oomsis Forestry Reserve, R.A.I. Drew and D.W. Currey; 3 σ (18–22.vi.1980), Gabensis, on Lae–Bulolo road, R.A.I. Drew and D.W. Currey; 3 σ (24.vi.1980), Mt Susu, P. Daur; 1 σ (31.xii.1980), Mt Missim (1500 m), A. Allison; all attracted to cue lure. NEW BRITAIN: 1 σ (31.vii.1969), Keravat, attracted to Willison's lure, D. O'Sullivan.

LOCATION OF TYPES: Holotype (T.10475) and 1 paratype (T.10476) in QM; 4 paratypes in ANIC; 2 paratypes in BMNH; 1 paratype in DPI(PNG); 8 paratypes in DPI.

DISTRIBUTION

Known only from the Morobe Province, Papua New Guinea and New Britain.

DIAGNOSIS

Medium sized species; medium sized triangular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripes broad reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a moderately broad medial and 2 broad lateral longitudinal dark bands connected along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.75 mm. Frons narrowing slightly posteriorly, length 1.58 times breadth; fulvous with pale fuscous around orbital bristles; anteromedial hump with a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized triangular black spots; length of face 0.5 mm. Genae fulvous, small brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 3–6 well developed black bristles. Antennae with segments 1 and 2 red-brown, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.38 mm; 0.93 mm.

Thorax mesonotum black except dark brown below and behind lateral postsutural vittae. Pleural areas black except brown below humeral calli and dark fuscous above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe reaching anterior npl. bristle

dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid and hind coxae dark fuscous; all other segments fulvous except pale fuscous tint on apical areas of fore femora and basal 1/3 of fore tibiae, fuscous hind tibiae; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.5 mm; costal cells pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for narrow dark fuscous lateral margins and a very narrow discontinuous transverse dark fuscous band across centre which reaches lateral margins; terga III–V orange-brown except as follows: a broad transverse black band across anterior margin of tergum III; 2 lateral longitudinal bands which are black anteriorly on tergum III, dark fuscous posteriorly on tergum III and anteriorly on tergum IV, fuscous posteriorly on tergum IV and laterally on tergum V; a moderately broad medial longitudinal black band over all 3 terga; tergum V fuscous between the dark fuscous oval shining spots. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. consectorata is similar to *B. fuliginus* (Drew and Hancock) in having a wide mesopleural stripe reaching to or anterior to the anterior npl. bristle but differs in the mesopleural stripe reaching the anterior npl. bristle whereas in *B. fuliginus* it extends almost to the humeral callus.

Bactrocera (Bactrocera) fuliginus
(Drew and Hancock), n. comb (Fig. 18)

Dacus (Bactrocera) fuliginus Drew and Hancock, 1981: 66–7.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8261) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Cape York Peninsula, Queensland (type locality, Lockerbie).

NEW RECORDS: Papua New Guinea, Northern District: 1 ♂ (24.viii.1966), 1 ♂ (31.x.1966), Popondetta, B. Keoro; Morobe Province: 1 ♂, Gabensis, on Lae–Bulolo Road, attracted to cue lure, 18–22.vi.1980, R.A.I. Drew and D.W. Currey. Torres Strait islands: Badu I. (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large oval facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching almost to humeral callus, lateral postsutural vittae present, medial postsutural vittae absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal dark bands.

ATTRACTANT: Cue lure.

COMMENTS

B. fuliginus is similar to *B. consectorata* in having a wide mesopleural stripe extending to or anterior to anterior npl. bristle but differs in having a wider mesopleural stripe reaching almost to humeral callus.

***Bactrocera (Bactrocera) inconstans*, n. sp**
(Fig. 19)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute (1400 m), attracted to cue lure, 16.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: Upper Manki Logging area, Bulolo, 1 ♂ (21.iii.1980), 1 ♂ (25.iii.1980), 1 ♂ (28.iii.1980), 1 ♂ (1.iv.1980), attracted to cue lure, P. Daur; Upper Stony logging area, Bulolo, 3 ♂ (15.ii.1980), 3 ♂ (18.ii.1980), attracted to cue lure, P. Daur; 1 ♂, Wau, attracted to Willison's lure, 3–10.iv.1965, E.N. Marks; 8 ♂, Mt Missim (1350–1650 m), attracted to cue lure, 30.x.1980, A. Allison. Central Province: 1 ♂, Bisianumu, Sogeri, attracted to cue lure, 25.vi.1980, R.A.I. Drew and D.W. Currey.

LOCATION OF TYPES: Holotype (T.10477) and 1 paratype (T.10478) in QM; 4 paratypes in ANIC; 2 paratypes in BMNH; 1 paratype in DPI(PNG); 12 paratypes in DPI.

DISTRIBUTION

Known from Morobe and Central Provinces, Papua New Guinea.

DIAGNOSIS

Small species; small circular fuscous facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells very pale fulvous, microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V pale orange-brown except for a narrow medial and 2 moderately broad lateral longitudinal dark bands over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.25 mm. Frons of even width, length 1.45 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small circular to oval fuscous spots; length of face 0.40 mm. Genae fulvous, with large fuscous subocular spot present; fuscous bristle present. Occiput fuscous, yellow along eye margins; occipital row with 3–5 well developed bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.25 mm; 0.68 mm.

Thorax mesonotum black except dark brown below and behind lateral postsutural vittae, along mesonotal suture, above notopleural suture. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing sharply posteriorly to end well before upper pa. bristles (occasionally these vittae are broader and end at the upper pa. bristles). Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1;

npl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except hind tibiae fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells colourless to very pale fulvous; microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless or with a pale fulvous tint, fuscous subcostal cell, narrow fuscous costal band confluent with or just overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse orange-brown band posterocentrally; tergum II pale orange-brown except for a broad transverse dark fuscous band across anterior $\frac{1}{2}$ and becoming fuscous as it expands to cover lateral margins; terga III–V pale orange-brown except for 2 moderately broad lateral longitudinal bands which are dark fuscous to fuscous on tergum III and fuscous to pale fuscous on terga IV and V, a narrow medial longitudinal dark fuscous to black band over all 3 terga. A pair of oval orange-brown to fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. inconstans is similar to *B. mimulus* (*dorsalis* complex) and *B. aemula* (*aemula* complex) in possessing a mesopleural stripe which ends midway between anterior margin of notopleural callus and anterior npl. bristle above but differs in having the costal band confluent with R_{2+3} and a pale fuscous tint across wing membrane.

Bactrocera* (*Bactrocera*) *indecora
(Drew), n. comb (Fig. 20)

Dacus (*Asiadacus*) *indecorus* Drew, 1971: 37–9.

Dacus (*Strumeta*) *indecorus*: Drew, 1972a: 19, 21.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI.
LOCATION OF TYPE: Holotype ♂ (T.6932) in QM.

DISTRIBUTION

New Britain and Lihir I. (type locality).

DIAGNOSIS

Medium sized species; circular facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vittae absent, scutellum yellow, prescutellar bristles absent; wing with a narrow fuscous costal band and broad fuscous anal streak, first costal cell pale fulvous and second costal cell colourless, microtrichia in outer corner of second costal cell only; abdominal terga II–V orange-brown with a broad medial longitudinal black band over all 4 terga and 2 broad lateral longitudinal dark bands over terga III–V.

ATTRACTANT: Cue lure.

COMMENTS

B. indecora was described adequately by Drew (1971). It is similar to *B. vulgaris* (Drew) in having the mesopleural stripe reaching to the anterior npl. bristle above but differs from this species in the costal band being confluent with R₂₊₃ (not overlapping), lateral postsutural vittae parallel sided and ending before upper pa. bristle, prescutellar bristles absent. It is significant that the distribution of *B. indecora* is New Britain and New Ireland whereas *B. vulgaris* occurs in mainland Papua New Guinea.

***Bactrocera (Bactrocera) laticosta*, n. sp**
(Fig. 21)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central District: Hombrom Bluff, attracted to cue lure, 30.iii.1974, J. Stibick.

Paratypes, PAPUA NEW GUINEA, Central District: 1 ♂ (16.xi.1973), 7 ♂ (30.xi.1973), 7 ♂ (5.i.1974), 4 ♂ (16.i.1974), Hombrom Bluff, J. Stibick; 3 ♂ (3.iii.1970), Brown River, T.L. Fenner; 1 ♂ (9.xi.1973), Sogeri, J. Stibick; 1 ♂ (30.xi.1973) and 1 ♂ (16.i.1974), Ninoa Estate, J. Stibick; 1 ♂ (8.xii.1973) and 5 ♂ (19.i.1974), Crystal Rapids, J. Stibick; all above paratypes attracted to cue lure. Morobe Province: 1 ♂, Wau Ecology Institute, Mt Kaindi (1230 m), attracted to cue lure, 15.xii.1980, A. Allison. WEST NEW BRITAIN: 1 ♂, Dami Oil Palm Station, attracted to Willison's lure, 5–9.vi.1972, J. Stibick.

LOCATION OF TYPES: Holotype (T.10479) and 2 paratypes (T.10480–T.10481) in QM; 4 paratypes in ANIC; 4 paratypes in BMNH; 1 paratype in DPI(PNG); 22 paratypes in DPI.

DISTRIBUTION

Known from the Central District and Morobe Province, Papua New Guinea and West New Britain.

DIAGNOSIS

Medium sized species; very large subquadrate facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band and narrow fuscous anal streak, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga III–V dark orange-brown except for broad lateral and medial longitudinal dark bands which connect along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons of even width, length 1.31 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fuscous with very large subquadrate black spots; length of face 0.55 mm. Genae fulvous, brown subocular spot present; fulvous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 5–10 well developed black bristles. Antennae with segments 1 and 2 red-brown, segment 3 fuscous; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.35 mm; 0.93 mm.

Thorax mesonotum black except dark brown markings as follows: below and behind lateral postsutural vittae; along mesonotal suture; between humeral and notopleural calli; inside humeral calli. Pleural areas dark fuscous except a black area on sternopleuron and red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width, narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; fore and mid femora dark fuscous (paler on ends), hind femora with apical 1/3 dark

fuscous (remainder fulvous); fore and hind tibiae dark fuscous, mid tibiae fulvous; all tarsi fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.4 mm; costal cells with pale fulvous tint, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} (except for a very narrow pale line above R_{4+5} centrally) and ending just beyond extremity of R_{4+5} , narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous to dark fuscous; tergum II orange-brown except anterolateral corners fuscous to dark fuscous and a transverse fuscous to dark fuscous band centrally but not reaching lateral margins; terga III–V dark orange-brown except for a broad transverse dark fuscous to black band cross anterior $\frac{1}{2}$ of tergum III, 2 broad lateral longitudinal bands which are dark fuscous on terga III and IV and fuscous on tergum V, a broad medial longitudinal band which is dark fuscous on tergum III and black on terga IV and V. A pair of oval dark orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. laticosta is similar to *B. abdolonginqua* (Drew) and *B. dapsiles* (*dorsalis* complex) and *B. indecora* (Drew) and *B. vulgaris* (Drew) (*aemula* complex) in possessing costal cells coloured with a pale fulvous tint. It differs from *B. abdolonginqua* and *B. dapsiles* in having a broader costal band which is almost confluent with R_{4+5} and from *B. indecora* and *B. vulgaris* in having a narrower mesopleural stripe which ends midway between anterior margin of notopleural callus and anterior npl. bristle.

Bactrocera*) *trivialis (Drew), n. comb. (Figs 22–24)

Dacus (*Strumeta*) *trivialis* Drew, 1971: 93–5.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6968) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Throughout Papua New Guinea (type locality, Kiwai I.) and Irian Jaya. NEW RECORDS: Torres Strait islands: Badu, Boigu, Saibai (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized pear shaped facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; males with all leg segments fulvous except hind tibiae fuscous, females with dark colour patterns on femora and tibiae; abdominal terga III–V generally black with a medial longitudinal fulvous area from posterior margin of tergum III to tergum V.

DESCRIPTION

FEMALE: Ovipositor basal segment fuscous, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.74:1. Apex of piercer needle shaped with subapical bristles (Fig. 23). Spicules at distal end of middle segment wide with 11–15 small indentations of uneven length (Fig. 24).

HOST PLANTS

NEW RECORDS: *Capsicum* (Sogeri, Central District, August 1984, F. Dori) and grapefruit (Mt Hagen, Western Highlands District, 1980 and 1981, B. Thistleton). There are no known wild host records.

ATTRACTANT: Cue lure.

COMMENTS

B. trivialis was described adequately by Drew (1971). However, a large collection of specimens recently reared from grapefruit at Mt. Hagen, 1980, 1981, show sexual dimorphism in leg colour patterns: females possess fore, mid and apical $\frac{1}{3}$ of hind femora dark fuscous, fore tibiae and apical 4 segments of fore tarsi fuscous, hind tibiae dark fuscous; males have all segments fulvous except hind tibiae fuscous. It is similar to *B. cacuminata* (Hering), *B. nigrescens* (Drew) and *B. opiliae* (Drew and Hardy) (*dorsalis* complex) in having colourless costal cells and the mesopleural stripe reaching midway between the anterior margin of notopleural callus and anterior npl. bristle. It differs from *B. cacuminata* and *B. opiliae* in having an entirely

black mesonotum and from *B. nigrescens* in having abdominal terga III–V mostly dark fuscous to black except orange-brown posterocentrally on tergum III and centrally on terga IV and V.

Bactrocera (Bactrocera) vulgaris
(Drew), n. comb. (Figs 25–27)

Dacus (Strumeta) vulgaris Drew, 1971: 99–100.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6973) in QM.

DISTRIBUTION

Known throughout Papua New Guinea (type locality, Kainantu).

DIAGNOSIS

Medium sized species; medium sized oval facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wings with a narrow fuscous costal band and anal streak, first costal cell pale fulvous, second costal cell colourless, microtrichia in outer corner of second costal cell only; abdominal terga II–V orange-brown with a broad medial longitudinal dark band over all 4 terga and narrow lateral longitudinal dark bands on terga III–V.

DESCRIPTION

FEMALE: Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 2.03:1. Apex of piercer rounded with 4 pairs of subapical bristles (Fig. 26). Spicules at distal end of middle segment of medium width with 8–10 dentations of uneven length (Fig. 27). **ATTRACTANT:** Cue lure, Willison's lure.

COMMENTS

B. vulgaris was described adequately by Drew (1971). It is similar to *B. abdolonginqua* (Drew), *B. dapsiles* (*dorsalis* complex) and *B. indecora* (Drew), *B. laticosta* (*aemula* complex) in having costal cells coloured with a pale fulvous tint. It differs from *B. abdolonginqua*, *B. dapsiles* and *B. laticosta* in having a broader mesopleural stripe reaching to anterior npl. bristle, and from *B. indecora* in prescutellar bristles being present, costal band overlapping R_{2+3} and lateral postsutural vittae narrowing posteriorly to end at upper pa. bristles.

alyxiae complex

DEFINITION OF COMPLEX: *Bactrocera* species with infuscation on wing as a broad incomplete shaped band across centre and a narrow transverse band across apex in addition to costal band and anal streak, mesopleural stripe broad (reaching humeral callus dorsally), lateral postsutural vittae present, medial postsutural vitta absent, scutellum entirely yellow, males of some species attracted to cue lure.

Bactrocera (Bactrocera) alyxiae
(May), n. comb. (Figs 28–30)

Strumeta alyxiae May, 1952: 335–7.

Dacus (Strumeta) alyxiae: Drew, 1974a: 14–16.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.5275) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: North Queensland (type locality, Mossman) and Papua New Guinea.

NEW RECORDS: Torres Strait islands: Badu, Boigu, Hammond, Horn, Moa (Banks), Prince of Wales, Saibai, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized pear shaped facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with broad lateral longitudinal dark markings, mesopleural stripe reaching to humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wings with a broad fuscous costal band and anal streak, a broad recurved fuscous band across centre of wing and a narrow pale fuscous band across apex of wing, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with 2 broad lateral longitudinal fuscous bands.

DESCRIPTION

FEMALE: Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.69:1. Apex of piercer tapering sharply from line of subapical bristles and rounded bluntly, with 3 pairs of subapical bristles (Fig. 29). Spicules at distal end of middle segment of medium width with 8–10 uneven elongate dentations (Fig. 30).

ATTRACTANT: Cue lure.

COMMENTS

Balyxia was described adequately by Drew (1974a) except that the mesonotum was defined as dull black rather than red-brown with irregular broad lateral longitudinal fuscous to dark fuscous bands. It is similar to *B. repanda* in having an identical wing colour pattern and similar yellow markings on thorax but differs from this species in having 2 broad lateral longitudinal fuscous bands on abdominal terga III-V.

***Bactrocera (Bactrocera) repanda*, n. sp.**
(Fig. 31)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western District: 4 miles E of Morehead, 30.ix.1972, J. Stibick.

Paratypes, PAPUA NEW GUINEA, Western District: 3 ♂♂, 4 miles E of Morehead, 30.ix.1972, J. Stibick. East Sepik Province: 2 ♂♂, Maprik, Oct.-Dec. 1957, Malaria Control Sect.

LOCATION OF TYPES: Holotype (T.10482) in QM; 1 paratype in ANIC; 4 paratypes in DPI.

DISTRIBUTION

Known from Western District and East Sepik Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum black with fuscous markings, mesopleural stripe broad reaching to humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a narrow transverse fuscous band across apex of wing and a broad recurved fuscous band across centre, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown except for narrow transverse fuscous bands anterolaterally on tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.75 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles fuscous: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.43 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput red-brown, yellow along eye margins; occipital row with

5-7 well developed red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong red-brown dorsal bristle on segment 2; length of segments: 0.20 mm; 0.35 mm.

Thorax mesonotum black except fuscous markings as follows: a medial longitudinal band which broadens to cover posterior area, below and behind lateral postsutural vittae, around mesonotal suture, between humeral and notopleural calli, inside humeral calli. Pleural areas fuscous to dark fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching to humeral callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin concave; upper hypopleural calli (posterior apices dark fuscous); anterior 3/5 lower hypopleural calli (remainder dark fuscous); 2 lateral postsutural vittae of medium width narrowing posteriorly to end before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; npl. 1; mpl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and ending between extremities of R_{4+5} and M, a narrow transverse fuscous band across apex of wing, a broad transverse fuscous band across centre of wing which encloses both crossveins and recurves back along posterior margin of CuA_1 , a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 - CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I pale fuscous tending darker laterally; tergum II orange-brown except for a broad pale fuscous transverse band across anterior 1/2 and widening to cover lateral margins; terga III-V orange-brown except for a narrow transverse fuscous band anterolaterally on tergum III. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. repanda is similar to *B. alyxiae* (May) in

having an identical wing colour pattern and similar yellow markings on thorax but differs in having abdominal terga III–V orange-brown except for narrow transverse anterolateral fuscous spots on tergum III.

anthracina complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for narrow costal band (not confluent with R₄₊₅) and anal streak, lateral postsutural vittae present, medial postsutural vitta absent, humeral and notopleural calli yellow, scutellum yellow with narrow dark basal band, mesonotum and abdominal terga entirely black, males of some species attracted to cue lure.

***Bactrocera (Bactrocera) anthracina* (Drew), n. comb. (Fig. 32)**

Dacus (Strumeta) anthracinus Drew, 1971: 59–61.

MATERIAL EXAMINED

Holotype ♂, Upper Warangoi Valley, New Britain, attracted to cue lure, October 1969, D.F. O'Sullivan.

LOCATION OF TYPE: Holotype (T.6945) in QM.

DISTRIBUTION

Upper Warangoi Valley, New Britain (type locality).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe equal in width to notopleural callus, scutellum yellow; wings with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous, microtrichia in outer corner of second costal cell only; all abdominal terga black.

ATTRACTANT: Cue lure.

COMMENTS

B. anthracina was described adequately by Drew (1971). It is similar to *B. batemani* (*nigella* complex) in possessing coloured costal cells with microtrichia in outer corner of second costal cell only but differs in having broad lateral postsutural vittae ending behind the upper pa. bristles and legs with all tibiae and apices of all femora fuscous.

***Bactrocera (Bactrocera) aterrima* (Drew), n. comb. (Fig. 33)**

Dacus (Strumeta) aterrimus Drew, 1972b: 204–5.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6991) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Bougainville I. (type locality, Daru Village).

NEW RECORD: Shortland Is (Solomon Islands).

DIAGNOSIS

Medium sized species; very large black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching almost to humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad black basal band; wing with a narrow pale fuscous costal band and a broad fuscous anal streak, costal cells colourless to extremely pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga mostly dull black.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. aterrima was described adequately by Drew (1972b). It is similar to *B. nigella* (Drew) (*nigella* complex) and *B. terminaliae* (*anthracina* complex) in possessing costal cells colourless or almost colourless but differs in having the mesopleural stripe reaching almost to the humeral callus and the lateral postsutural vittae ending well before the upper pa. bristle.

***Bactrocera (Bactrocera) caliginosa* (Hardy), n. comb.**

Dacus (Strumeta) caliginosus Hardy, 1970: 116–8; Drew, 1974a: 24–5.

MATERIAL EXAMINED

1 ♂ paratype, Yalom, New Britain, May 1962, collected on Noona Dan Expedition.

LOCATION OF TYPE: Holotype ♂ in ZMC.

DISTRIBUTION

Yalom, New Britain (type locality).

DIAGNOSIS

Medium sized species; large elongate black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vittae absent, scutellum yellow with a broad black basal band; wing with a narrow fuscous costal band and broad

fuscous anal streak, costal cells pale fuscous with microtrichia in all of second costal cell and most of first cell; abdominal terga mostly black.

ATTRACTANT: No known record.

COMMENTS

B. caliginosa was described adequately by Hardy (1970) with additional notes by Drew (1974a). It is similar to *B. kelaena* (*nigella* complex) in possessing coloured costal cells with microtrichia covering all of second and most of first costal cells but differs in having narrow lateral postsutural vittae ending well before the upper pa. bristle, scutellum with a broad black basal band and the mesopleural stripe not reaching the humeral callus above.

Bactrocera (Bactrocera) terminaliae, n. sp. (Figs 34–36)

TYPE SPECIMENS

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Oomsis logging area, bred ex fruit of *Endiandra* sp., 17.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province, Oomsis: 1 ♀, bred ex fruit of *Endiandra* sp., 17.vi.1980, R.A.I. Drew and D.W. Currey; 1 ♀ (29.iii.1978) and 1 ♀ (20.iii.1979), bred ex fruit of *Terminalia complanata*, J. Simpson.

LOCATION OF TYPES: Holotype (T.10483) in QM; 1 paratype in ANIC; 2 paratypes in DPI.

DISTRIBUTION

Known only from Oomsis, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots large and oval; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless, microtrichia covering outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V black except for small orange-brown areas each side of a narrow medial longitudinal fuscous to dark fuscous band on tergum V and posterior area of tergum IV.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.7 times breadth; fulvous with fuscous around orbital

bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large oval black spots; length of face 0.45 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fuscous, yellow along eye margins; occipital row with 5–8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.28 mm; 0.80 mm.

Thorax mesonotum black except brown behind lateral postsutural vittae. Pleural areas dark fuscous to black except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior 5/9 lower hypopleural calli (remainder including broad ventral margins dark fuscous); 2 lateral postsutural vittae of medium width narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae dark fuscous; fore femora dark fuscous (tending fulvous basally), mid femora black, hind femora with apical $\frac{1}{3}$ black (remainder fulvous); fore and mid tibiae fuscous (fore tibiae slightly darker), hind tibiae dark fuscous; all tarsi fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.6 mm; costal cells colourless; microtrichia covering outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for a broad transverse black band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III–V mostly black except for small orange-brown areas either side of a narrow medial

longitudinal fuscous to dark fuscous band on tergum V and posterior margin of tergum IV. A pair of oval dark fuscous shining spots on tergum V. Basal segment of ovipositor dark fuscous, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 0.81:1. Apex of piercer needle shaped with 2 pairs of large subapical bristles (Fig. 35). Spicules at distal end of middle segment of medium width with 4–5 broad and occasional smaller dentations (Fig. 36).

ATTRACTANT: No known record.

COMMENTS

B. terminaliae is similar to *B. aterrima* (Drew) (*anthracina* complex) and *B. nigella* (Drew) (*nigella* complex) in possessing costal cells colourless or almost so but differs from *B. aterrima* in having the mesopleural stripe ending well before the humeral callus above and lateral postsutural vittae ending at the upper pa. bristles. It differs from *B. nigella* in having large oval facial spots, femora dark fuscous to black (except hind femora with basal $\frac{1}{3}$ fulvous), fore and mid tibiae fuscous and hind tibiae dark fuscous.

assita complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for a narrow costal band (not confluent with R_{4+5}) and anal streak, costal cells generally coloured, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a dark basal band, mesonotum black, abdominal terga III–V mostly orange-brown, males of some species attracted to cue lure.

Bactrocera (Bactrocera) assita, n. sp. (Fig. 37)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Milne Bay Province: Gurney, 16–23.vii.1977, A. Eteboyo.

Paratypes, PAPUA NEW GUINEA, Milne Bay Province: 1 ♂ (Dak Pot trap), Waigani, 16–23.vii.1977, A. Eteboyo; 1 ♂, Gurney, 16–23.vii.1977, A. Eteboyo. Morobe Province: 1 ♂, Buba, attracted to cue lure, June–July 1971 and 1 ♂, Buba, attracted to Willison's lure, April–May 1971, J. Maiyel; 1 ♂, Mt Missim (1100 m), attracted to cue lure, 30.vii.1981, A. Allison.

LOCATION OF TYPES: Holotype (T.10484) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 3 paratypes in DPI.

DISTRIBUTION

Known from Milne Bay and Morobe Provinces, Papua New Guinea.

DIAGNOSIS

Small species; facial spots medium sized and oval; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe slightly wider than notopleural callus dorsally, scutellum yellow; wing with a narrow fuscous costal band (but almost confluent with R_{4+5}) and broad fuscous anal streak, first costal cell very pale fuscous, second costal cell pale fuscous, microtrichia covering second costal cell and most of first costal cell; abdominal terga III–V orange-brown except for lateral longitudinal fuscous bands which are broad on tergum III and either narrow or absent on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.55 times breadth; fulvous with at most pale fuscous around s.or. bristles, anteromedial hump prominent and covered by a small number of short pale setae; orbital bristle dark fuscous: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots; length of face 0.43 mm. Genae fulvous, brown subocular spot present; dark fuscous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 3–4 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.73 mm.

Thorax mesonotum black except brown behind lateral postsutural vittae. Pleural areas dark fuscous to black except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, slightly wider than notopleural callus, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width, narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs all coxae fuscous; all other segments fulvous; rows of short pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.3 mm; first costal cell pale fuscous, second costal cell fuscous, microtrichia

covering second costal cell and most of first costal cell; remainder of wings colourless except dark fuscous subcostal cell, narrow dark fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, broad dark fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown with a broad transverse dark fuscous band across anterior $\frac{1}{3}$ and widening to cover lateral margins; terga III–V orange-brown except for lateral longitudinal fuscous bands which are broad on tergum III and either narrow or absent on terga IV and V. A pair of oval orange-brown to pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. assita is similar to *B. bancroftii* (Tryon) (*musae* complex), *B. circumusae*, *B. contermina* and *B. contigua* (*assita* complex) in possessing coloured costal cells but differs from these species in having fuscous costal cells covered by dense microtrichia.

Bactrocera (Bactrocera) brevistriata (Drew), n. comb. (Figs 38–40)

Strumeta brevistriata Drew, 1968b: 77–8.

Dacus (Strumeta) brevistriatus: Drew, 1972a: 21.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).
LOCATION OF TYPE: Holotype ♂ (T.6611) in QM.

DISTRIBUTION

Known from Bulolo to Wau (type locality), Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots either absent or very pale and small; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown with a narrow elongate medial fuscous spot on tergum V.

DESCRIPTION

FEMALE: Ovipositor ratio of length of oviscapae to length of tergum V 1.7:1; apex of piercer tapering sharply to a point from line of subapical bristles, with 4 pairs of subapical bristles (Fig. 39). Spicules at distal end of middle segment of medium width with 4–7 short broad triangular dentations (Fig. 40).

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. brevistriata was described adequately by Drew (1968b). It is similar to *B. prolixa* (*musae* complex) and *B. commina* (*assita* complex) in having lateral postsutural vittae ending before upper pa. bristles. It differs from *B. commina* in possessing colourless costal cells, abdominal terga II–V mostly uniformly orange-brown and in the shape of the apex of the piercer and spicules on the middle segment of the ovipositor. *B. brevistriata* differs from *B. prolixa* in having the costal band confluent with R_{2+3} and abdomen oval with a medial longitudinal fuscous band on tergum III.

Bactrocera (Bactrocera) circumusae, n. sp. (Fig. 41)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, attracted to cue lure, 22.vi.1980, R.A.I. Drew and D^N. Currey.

LOCATION OF TYPE: Holotype (T.10485) in QM.

DISTRIBUTION

Known only from Oomsis, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; small pale fuscous facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe broad reaching almost to anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous, microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga I–V orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.75 mm. Frons of even width, length 1.6 times breadth; fulvous with pale fuscous around s.or. bristles and upper pair of i.or. bristles; anteromedial hump with a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or. (3

on 1 side); lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with small pale fuscous spots present; length of face 0.50 mm. Genae fulvous, subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.33 mm; 0.85 mm.

Thorax mesonotum black except brown markings as follows: below and behind lateral postsutural vittae, around mesonotal suture, above notopleural suture, inside humeral calli. Pleural areas black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous; mid tibiae each with an apical black spur; rows of long pale setae on dorsal surfaces of fore femora.

Wings length 6.6 mm; costal cells fulvous; microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band just overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V orange-brown with no dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. circumusae is similar to *B. bancroftii* (Tryon) (*musae* complex), *B. contermina* and *B. contigua* (*assita* complex) in possessing pale coloured costal cells with microtrichia in outer corner of second costal cell only but differs in having the

mesopleural stripe reaching anterior npl. bristle dorsally, facial spots very small and pale and costal cells fulvous.

Bactrocera (Bactrocera) commina, n. sp. (Figs 42–44)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Upper Stony logging area, Bulolo, collected under leaf of *Musa* sp., 20.VII.1979, H. Ivagai.

LOCATION OF TYPE: Holotype (T.10486) in QM.

DISTRIBUTION

Known only from Upper Stony logging area, Bulolo, Morobe Province, Papua New Guinea.

DIAGNOSIS

Small species; medium sized triangular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band (but not confluent with R_{4+5}) and anal streak, costal cells pale fulvous, microtrichia covering most of second costal cell; abdominal terga III–V orange-brown except for a narrow medial and 2 moderately broad lateral longitudinal dark bands over all 3 terga and joined along anterior margin of tergum III.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.15 mm. Frons of even width, length 1.47 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized triangular black spots; length of face 0.35 mm. Genae fulvous, large fuscous subocular spot present; fuscous bristle present. Occiput fuscous, yellow along eye margins; occipital row with 2–4 weak bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a weak pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.25 mm; 0.65 mm.

Thorax mesonotum black except dark brown below and behind lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally,

continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing slightly posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2 scp. 4; all bristles weak and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous except fore and mid tibiae fuscous, hind tibiae dark fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.7 mm; costal cells pale fulvous; microtrichia along anterior margin of first costal cell and covering most of second costal cell except posterior margin; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for a broad black transverse band across anterior $\frac{1}{2}$ which changes to dark fuscous as it widens to cover lateral margins; terga III–V orange-brown except for a narrow transverse dark fuscous band across anterior margin of tergum III, a narrow medial longitudinal dark fuscous band and 2 moderately broad lateral longitudinal fuscous bands over all 3 terga. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 2.46:1; apex of piercer rounded at tip with 3 pairs of subapical bristles (Fig. 43). Spicules at distal end of middle segment of medium width with 2–4 dentations, 1 or 2 of which are elongate and broad (Fig. 44).

ATTRACTANT: No known record.

COMMENTS

B. commina is similar to *B. prolixa* (*musae* complex) and *B. brevistriata* (Drew) (*assita* complex) in having lateral postsutural vittae ending before upper pa. bristle but differs from these species in having costal cells pale fulvous, abdominal terga III–V orange-brown with narrow medial and lateral longitudinal pale fuscous to

fuscous bands joined along anterior margin of tergum III. It also differs from *B. brevistriata* in the shape of the apex of the piercer and spicules on the middle segment of the ovipositor.

Bactrocera (Bactrocera) contermina, n. sp. (Figs 45–47)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Stony logging area, Bulolo, attracted to a yellow tray, 26.i.1979, H. Roberts.

LOCATION OF TYPE: Holotype (T.10487) in QM.

DISTRIBUTION

Known only from Stony logging area, Bulolo, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; small circular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band (but not confluent with R_{4+5}) and anal streak, costal cells very pale fulvous, microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V orange-brown except for 2 narrow lateral longitudinal fuscous bands joined along anterior margin of tergum III and a narrow medial longitudinal fuscous band from centre of tergum III to posterior margin of tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.45 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small circular black spots; length of face 0.43 mm. Genae fulvous, large brown subocular spot present; fuscous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 6–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fuscous except fulvous along ventral margin; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.78 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae. Pleural areas

dark fuscous except red-brown below humeral calli, above mid coxae and black on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior 3/5 lower hypopleural calli (remainder dark fuscous); 2 lateral postsutural vittae of medium width narrowing slightly posteriorly to end at pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except fore tibiae pale fuscous and hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.5 mm; costal cells very pale fulvous; microtrichia in outer 1/3 of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. All terga orange-brown, without dark markings. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of ov scape to length of tergum V 2.0:1; apex of piercer narrow and needle shaped with 5 pairs of subapical bristles (Fig. 46). Spicules at distal end of middle segment wide with 9–14 thin dentations of approximately equal size (Fig. 47).

ATTRACTANT: No known record.

COMMENTS

B. contermina is similar to *B. bancroftii* (Tryon) (*musae* complex) and *B. contigua* (*assita* complex) in possessing pale fulvous costal cells, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle and clearly defined facial spots. It differs from *B. bancroftii* in having scutellum entirely yellow without a dark spot on apex and from *B. contigua* in having all abdominal terga uniformly orange-

brown and in the shape of the apex of the piercer and spicules on middle segment of the ovipositor.

Bactrocera (Bactrocera) contigua, n. sp. (Figs 48–50)

TYPE SPECIMENS

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Robbies Creek, Stony logging area, Bulolo, hand collected under leaf of *Musa* sp., 13.vii.1979, H. Roberts.

Paratype, PAPUA NEW GUINEA, Morobe Province: 1 ♀, Robbies Creek, Stony logging area, Bulolo, hand collected under leaf of *Musa* sp., 13.vii.1979, H. Roberts.

LOCATION OF TYPES: Holotype (T.10488) in QM; paratype in DPI.

DISTRIBUTION

Known only from the Bulolo area, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; small to medium circular black facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band and narrow fuscous anal streak, costal cells very pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for anterolateral corners of tergum III fuscous and a narrow medial longitudinal fuscous band over all 3 terga and broken at sutures.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.9 mm. Frons of even width, length 1.46 times breadth; fulvous with fuscous around orbital bristles and pale fuscous on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous with small to medium sized circular black spots; length of face 0.58 mm. Genae fulvous, large brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 5–8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.40 mm; 0.93 mm.

Thorax mesonotum black except brown

markings as follows: below and behind lateral postsutural vittae; along mesonotal suture; between humeral and notopleural calli; inside humeral calli. Pleural areas black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width and narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for a narrow black basal band. Bristles: sc. 4 (1 basal bristle weak); prsc. 2; pa 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs all coxae fuscous; all other segments fulvous except fore and mid tibiae pale fuscous and hind tibiae fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 7.0 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad dark fuscous transverse band across anterior margin which changes to fuscous as it widens to cover lateral margins; terga III–V orange-brown except for fuscous anterolateral corners on tergum III and a narrow medial longitudinal fuscous band which is broken at intersegmental lines (in the paratype there is a narrow fuscous band along anterior margin of tergum III). A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 1.68:1; apex of piercer rounded with 4 pairs of subapical bristles (Fig. 49). Spicules at distal end of middle segment of medium width with 1–4 dentations, 1–3 of which are very long (Fig. 50).

ATTRACTANT: No known record.

COMMENTS

B. contigua is similar to *B. bancroftii* (Tryon) (*musae* complex) and *B. contermina* (*assita* complex) in possessing pale fulvous costal cells, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle) and clearly defined facial spots. It differs from *B. bancroftii* in lacking a brown spot on apex of scutellum and in possessing dark markings on abdominal terga III–V and a wider costal band (at least as wide as subcostal cell). It differs from *B. contermina* in having abdominal tergum III with pale fuscous anterolateral corners, apex of ovipositor short and stout (length from gonopore to tip:width at preapical sensory bristles is 4.4:1), spicules at distal end of middle segment of ovipositor 2.5 times as wide as long with 1–3 very large dentations (Figs 49, 50).

Bactrocera (*Bactrocera*) *finitima*, n. sp. (Figs 51–53)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Robbies Creek, Stony logging area, Bulolo, hand collected on leaf of *Musa* sp., 3.vii.1979, H. Roberts.

LOCATION OF TYPE: Holotype (T.10489) in QM.

DISTRIBUTION

Known only from the Bulolo area, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized pear shaped facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band (but not confluent with R_{4+5}) and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V pale orange-brown except for a narrow medial longitudinal band on posterior $\frac{1}{2}$ of tergum IV and on tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.50 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small

number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.55 mm. Genae fulvous, large fuscous subocular spot present; fuscous bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.35 mm; 0.90 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae. Pleural areas black except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width, narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; sep. 4; all bristles well developed and dark fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 6.5 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II pale orange-brown except for an irregular fuscous spot anterocentrally; terga III–V pale orange-brown except for a narrow medial longitudinal band which is fuscous on posterior 1/2 of tergum IV and black on tergum V. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 2.63:1; apex of piercer narrow, needle shaped with

4 pairs of subapical bristles (2 large and 2 small) (Fig. 52). Spicules at distal end of middle segment of medium width with 8–12 thin dentations of approximately equal size (Fig. 53).

ATTRACTANT: No known record.

COMMENTS

B. finitima is similar to *B. musae* (Tryon) (*musae* complex) and *B. tinomiscii* (*assita* complex) in possessing a black mesonotum and colourless costal cells but differs in possessing a broader costal band (almost confluent with R_{4+5}), apex of ovipositor narrowing gradually from level of gonopore to tip and spicules at distal end of middle segment with 8–12 dentations of approximately equal size.

Bactrocera (Bactrocera) robertsi, n. sp. (Fig. 54)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute (1400 m), attracted to cue lure, 16.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Wau Ecology Institute (1400 m), 16.vi.1980, R.A.I. Drew and D.W. Currey; 3 ♂♂ (28.iii.1980), 5 ♂♂ (1.iv.1980), Upper Manki logging area, Bulolo, P. Daur; 1 ♂ (26.v.1980), 1 ♂ (30.v.1980), Gumi Watut, Bulolo, P. Daur; 1 ♂, Mt Missim (1650 m), 30.x.1980 and 1 ♂, Mt Missim (1400 m), 4.vi.1981, A. Allison; 1 ♂, Mt Kaindi (1450 m), 18.vi.1980 and 1 ♂, Namie Creek, Mt Kaindi (1600 m), 15.xii.1980, A. Allison. Western Highlands Province: 1 ♂ (30.x.1978), 1 ♂ (6.xii.1978), Kuk Tea Research Station, Mt Hagen and 1 ♂, HATI, Mt Hagen, 3.ii.1981, B. Thistleton. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10490) and 1 paratype (T.10491) in QM; 4 paratypes in ANIC; 2 paratypes in BMNH, 1 paratype in DPI(PNG); 10 paratypes in DPI.

DISTRIBUTION

Known from the Morobe and Western Highlands Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with facial spots absent or very small and pale; humeral calli yellow; notopleural calli yellow except anterior 1/3 to 1/2 black; mesonotum black, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, first costal cell fulvous, second costal cell pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown with a narrow transverse dark band across anterior margin of tergum III, narrow irregular lateral

fuscous margins and a narrow medial longitudinal fuscous to black band on all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.73 mm. Frons of even width, length 1.42 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered with a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with spots absent or very small and pale; length of face 0.5 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 3–4 well developed dark bristles. Antennae with all segments fulvous except fuscous on apex and outer surface of segment 3; arista black (fulvous basally); length of segments: 0.18 mm; 0.33 mm; 0.85 mm.

Thorax mesonotum black except dark brown below lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli (black on anterior $\frac{1}{3}$ to $\frac{1}{2}$); mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin slightly convex; 2 moderately broad lateral postsutural vittae narrowing posteriorly to end before the upper pa. bristle; upper hypopleural calli (posterior apices black); anterior $\frac{3}{5}$ lower hypopleural calli (remainder black). Postnotum black. Scutellum yellow except for broad black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs coxae dark fuscous; all other segments fulvous except hind tibiae fuscous; mid tibiae each with an apical black spur; fore femora with rows of long dark setae on dorsal surfaces.

Wings length 7.0 mm; first costal cell fulvous, second costal cell pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless (or with a very pale fulvous tint) except for a fuscous subcostal cell, a narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III; tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse red-brown band across posterior margin. Tergum

II red-brown except for a broad transverse black band across anterior margin and ending before lateral margin. Terga III–V red-brown except for a narrow transverse band across anterior margin of tergum III which is fuscous in centre and dark fuscous on lateral margins, irregular narrow fuscous lateral margins on terga IV and V, a narrow medial longitudinal band which is fuscous on tergum III and black on terga IV and V. (Two specimens have terga III–V pale with only the medial longitudinal black band on terga IV and V.) A pair of red-brown oval shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. robertsi is similar to other species of the *assita* and *musae* complexes in possessing clear wings except for costal band and anal streak, a black mesonotum and abdominal terga mostly orange-brown but differs in having notopleural calli with anterior $\frac{1}{2}$ black and posterior $\frac{1}{2}$ yellow and a broad black basal band on the scutellum.

This species is named after Dr H. Roberts, Bulolo, who has provided valuable specimens through field collecting in Papua New Guinea.

Bactrocera (Bactrocera) tinomiscii, n. sp.

(Figs 55–58)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central District: in rainforest at Rouna Power Station No. 2, near Sogeri, bred ex *Tinomiscium phytocrenoides*, 25.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Central District: 1 ♀, Rouna Power Station No. 2, near Sogeri, caught on fruit of *Tinomiscium phytocrenoides*, 7.vi.1980, R.A.I. Drew and D.W. Currey; 20 ♂♂ and 29 ♀♀ (25.vi.1980), in rainforest at Rouna Power Station No. 2, near Sogeri, bred ex *Tinomiscium phytocrenoides*, R.A.I. Drew and D.W. Currey; 9 ♂♂ (25.vi.1980) in rainforest at Rouna Power Station No. 2, near Sogeri, attracted to cue lure, R.A.I. Drew and D.W. Currey. Morobe Province: 4 ♂♂ and 4 ♀♀ (21.vi.1980), Waramuri Creek, Bulolo, bred ex *Chlaenandra ovata*, H. Roberts; 3 ♀♀ (21.iv.1980), Waramuri Creek, Bulolo, bred ex fruit, P. Daur; 1 ♂ (December, 1978) and 1 ♀ (29.i.1979), Stony logging area, Bulolo, bred ex *Xanthophyllum* sp., H. Ivagai; 1 ♂ (14.vi.1978), Stony logging area, Bulolo, bred ex *Xanthophyllum* sp., H. Roberts; 1 ♂ (22.vi.1980), Bulolo, attracted to cue lure, R.A.I. Drew and D.W. Currey.

LOCATION OF TYPES: Holotype (T.10492) and 2 paratypes (T.10493–T.10494) in QM; 10 paratypes in ANIC; 10 paratypes in BMNH; 7 paratypes in DPI(PNG); 45 paratypes in DPI.

DISTRIBUTION

Known from Sogeri (Central District), Bulolo

(Morobe Province), Kassam Pass (Eastern Highlands District) and the Sepik District in Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with small irregularly oval facial spots; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with small fuscous markings on anterolateral and posterolateral corners of tergum III and with a narrow medial longitudinal dark band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.65 mm. Frons narrowing slightly posteriorly, length 1.65 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small irregularly oval spots present; length of face 0.53 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.33 mm; 0.80 mm.

Thorax mesonotum black except brown markings as follows: below and behind lateral postsutural vittae, around mesonotal suture, above notopleural suture, inside humeral calli and along anterior margin. Pleural areas fuscous except red-brown below humeral calli and black along anterior margin of mesopleural stripe and on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae narrowing slightly over posterior $\frac{1}{2}$ to end at upper pa. bristles. Postnotum black. Scutellum yellow except

for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid and hind coxae fuscous; remaining segments fulvous except basal $\frac{1}{2}$ of hind tibiae fuscous; mid tibiae each with an apical black spur.

Wings length 6.3 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band just overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a broad fuscous anal streak narrowing sharply to end before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous to dark fuscous except for orange-brown along posterior and lateral margins; tergum II orange-brown except for a narrow fuscous transverse band along anterior margin but not reaching lateral margins. Terga III–V orange-brown with small fuscous markings on anterolateral and posterolateral corners of tergum III and a narrow medial longitudinal band which is dark fuscous on tergum III and black on terga IV and V (in some specimens this band is absent on tergum III). A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 2.67:1. Apex of piercer needle shaped, curved upwards with 3 or 4 pairs of short subapical bristles; the upward curve of the apex is a most unusual character within the Dacinae (Figs 56, 57). Spicules at distal end of middle segment varying from wide to medium width with 4–6 dentations, some broad and elongate and some small (Fig. 58). **ATTRACTANT:** Cue lure.

COMMENTS

B. tinomiscii is similar to *B. musae* (Tryon) (*musae* complex) and *B. finitima* (*assita* complex) in possessing a black mesonotum and colourless costal cells but differs in possessing a paler costal band barely overlapping R_{2+3} and narrowing

towards apex of wing, apex of ovipositor curved upwards in lateral view, elongated and pointed sharply at tip, subapical sensory setae small and approximately of equal size (Figs 56, 57).

bidentata complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for a narrow costal band (not confluent with R_{4+5}) and anal streak, costal cell fulvous and without dense microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a narrow dark basal band, mesonotum red-brown (with or without dark colour patterns), abdominal terga III–V without dark colour patterns on lateral margins, males of some species attracted to cue lure.

***Bactrocera (Bactrocera) aeruginosa* (Drew and Hancock), n. comb. (Fig. 59)**

Dacus (Bactrocera) aeruginosus Drew and Hancock, 1981: 57–9.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8242) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Coastal areas of Queensland, north of Innisfail (type locality, Lockerbie in Cape York Peninsula).

NEW RECORD: Torres Strait islands: Saibai (record from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots; humeral and notopleural calli yellow; mesonotum pale red-brown, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous, microtrichia in outer corner of second costal cell only; abdominal terga mostly orange-brown with a narrow medial longitudinal dark band on terga IV and V and occasionally on tergum III.

ATTRACTANT: Cue lure.

COMMENTS

B. aeruginosa was described adequately by Drew and Hancock (1981). It is similar to *B. bidentata* (May) in possessing a uniformly red-brown mesonotum, abdominal terga III–V orange-brown

without dark lateral margins and costal cells fulvous without dense microtrichia but differs from this species in having broad parallel sided lateral postsutural vittae ending at upper pa. bristles, fulvous hind tibiae and costal band confluent with R_{2+3} .

***Bactrocera (Bactrocera) bidentata* (May), n. comb. (Figs 60–62)**

Strumeta bidentata (May), 1962b: 527–30; May, 1963: 50.

MATERIAL EXAMINED

Holotype ♂, 3 ♂ and 4 ♀ paratypes.

LOCATION OF TYPE: Holotype (T.5890) in QM.

DISTRIBUTION

Byfield (type locality) and Cairns, Queensland.

DIAGNOSIS

Medium sized species; medium sized circular black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs entirely fulvous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a narrow transverse fuscous band across anterior margin of tergum III, a medial longitudinal elongate fuscous spot on tergum IV and a black spot on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.5 times breadth; fulvous without dark markings; anteromedial hump covered by a large number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized circular black spots; length of face 0.48 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.73 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between

anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); 2 lateral postsutural vittae narrowing posteriorly to end just before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.0 mm; costal cells pale fuscous (second cell slightly paler); microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I and II orange-brown except fulvous along posterior margin of tergum II; terga III–V orange-brown except for a narrow transverse fuscous band across anterior margin of tergum III, a medial longitudinal elongate fuscous spot on tergum IV and a medial longitudinal elongate black spot on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, conical in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 1:1. Apex of piercer with 3 pairs of well developed subapical lobes; 3 pairs of subapical bristles (1 large and 2 small) (Fig. 61). Spicules at distal end of middle segment of medium width with 9–13 dentations of slightly uneven size (Fig. 62).

ATTRACTANT: No known record.

COMMENTS

B. bidentata is similar to *B. aeroginosa* (Drew and Hancock) in the characters listed in the comments on *B. aeroginosa* but differs from this

species in possessing narrow lateral postsutural vittae tapering sharply posteriorly to end before upper pa. bristles, hind tibiae brown and costal band overlapping R_{2+3} . *B. decurtans* (May) and *B. bidentata* are identical in external body colour patterns. The absence of prsc. and sa. bristles in *B. decurtans* may not be significant and it is probably an aberrant *Bactrocera* species. Both species have similar trilobed apices on the aculeus but can still be separated on this character.

bryoniae complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for a broad costal band (confluent with or overlapping R_{4+5}) and anal streak, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a dark basal band, mesonotum black, abdominal terga III–V orange-brown with variable dark colour patterns, males of some species attracted to cue lure.

Bactrocera (Bactrocera) bryoniae (Tryon), n. comb. (Figs 63–5)

Chaetodacus bryoniae Tryon, 1927: 192.

Chaetodacus costalis Shiraki, 1933: 66–9; Perkins, 1938: 127 (syn.).

Strumeta bryoniae: Perkins, 1938: 127–8; May, 1963: 50.

Dacus (Strumeta) bryoniae: Hardy, 1951: 148–9; Drew, 1974a: 21–4.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: *C. bryoniae*, lectotype ♀ (D.3124) and 3 ♂ paralectotypes (D.3124) in QM; *C. costalis*, ♂ ♀ syntypes in NTU.

DISTRIBUTION

PREVIOUSLY RECORDED: Widespread and abundant throughout its range (type locality, Eidsvold, Queensland). Known from northern coastal areas of Western Australia, Northern Territory (including Melville and Bathurst Is), Papua New Guinea, New Britain, New Ireland and Lihir I.

NEW RECORDS: Torres Strait islands: Badu, Boigu, Darnley, Horn, Moa (Banks), Murray, Saibai, Stephens, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Large species; irregularly circular black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vitta present, medial postsutural vitta absent,

scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fulvous, microtrichia covering outer $\frac{1}{2}$ of second costal cell only; abdominal terga III–V orange-brown with a medial and 2 lateral longitudinal dark bands joined along anterior margin of tergum III.

DESCRIPTION

FEMALE: Ovipositor basal segment of ovipositor red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.56:1. Apex of piercer very broad and rounded at tip, with 3 pairs of very small subapical bristles (Fig. 64). Spicules at distal end of middle segment narrow, scale-like with 2–4 short, broad, triangular dentations (Fig. 65).

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. bryoniae was described adequately by Drew (1974a). It is similar to other species in the *bryoniae* complex in possessing a broad costal band confluent with or overlapping R_{4+5} for its entire length, no infuscation on wing in addition to costal band and anal streak, lateral postsutural vittae present and medial postsutural vitta absent. It differs from these species in having costal band confluent with R_{4+5} , lateral postsutural vittae ending at upper pa. bristles, abdominal terga III–V red-brown with a broad, dark fuscous band along anterior margin of tergum III and covering lateral margins, anterolateral corners of terga IV and V fuscous and a medial longitudinal dark fuscous band over all 3 terga.

Drew (1978, 1982) listed *B. bryoniae* as a pest species in Queensland. This report was based on incorrect identifications. There are no records of this species reared from edible fruits and it cannot be considered of any economic importance.

Originally, Tryon (1927) designated a holotype, allotype and 2 paratypes but the specimens only have white labels marked "TYPE D/3124" and the description does not define which specimen is the holotype. A female and male are on 1 pin and 2 males on another pin. I am designating the female as the lectotype and the 3 males as paralectotypes. The specimens were collected at Eidsvold, Queensland by T.L. Bancroft.

Bactrocera (Bactrocera) epicharis (Hardy), n. comb.

Dacus (Strumeta) epicharis Hardy, 1970: 119–20; Drew, 1974a: 37.

MATERIAL EXAMINED

1 ♂ paratype, Malakata, Mussau I., June 1962, collected on Noona Dan Expedition.

LOCATION OF TYPE: Holotype ♂ in ZMC.

DISTRIBUTION

PREVIOUSLY RECORDED: Malakata, Mussau I. (type locality).

NEW RECORD: Shortland Is (Solomon Islands).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe equal in width to notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fulvous, microtrichia in outer corner of second costal cell only; abdominal terga mostly black.

ATTRACTANT: No known record.

COMMENTS

B. epicharis was described adequately by Hardy (1970) with additional notes by Drew (1974a). It is similar to the other species in the *bryoniae* complex in the characters listed in the comments on *B. bryoniae* but differs in having the costal band confluent with R_{4+5} , abdominal terga mostly black, microtrichia in outer corner of second costal cell only, legs with femora mostly dark fulvous, fore and mid tibiae dark fulvous and hind tibiae fuscous.

***Bactrocera (Bactrocera) latissima*, n. sp.** (Fig. 66)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute (1230 m), attracted to cue lure, 10.xi.1980, A. Allison.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 2 ♂♂, Gabensis, on Lae–Bulolo road, 18–22.vi.1980, R.A.I. Drew and D.W. Currey; 1 ♂, Mt Kaindi (1230 m), 15.x.1980, A. Allison; 1 ♂, 18.xii.1980, Mt Missim (1400 m) and 1 ♂, 19.iii.1981, Mt Missim (1350 m), A. Allison. Western Highlands Province: 1 ♂, 8.ix.1980 and 1 ♂, 21.x.1980, Kuk Agriculture Research Institute, Mt Hagen, B. Thistleton. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10495) in QM; 1 paratype in ANIC; 1 paratype in DPI(PNG); 5 paratypes in DPI.

DISTRIBUTION

Known from Morobe and Western Highlands Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; small oval facial spots

present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripes medium sized (reaching midway between anterior margin of notopleural calli and anterior npl. bristles), scutellum yellow; wing with a broad fuscous costal band and narrow fuscous anal streak, costal cells fulvous, microtrichia in outer $\frac{1}{3}$ to $\frac{3}{4}$ of second costal cell only; abdominal tergum III black and terga IV–V orange-brown with broad lateral and medial longitudinal dark bands connected along anterior $\frac{1}{2}$ of tergum IV.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.47 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small oval black spots; length of face 0.55 mm. Genae fulvous, large brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 7–9 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.38 mm; 0.93 mm.

Thorax mesonotum black except brown markings as follows: below and behind lateral postsutural vittae; along mesonotal suture; between humeral and notopleural calli; inside humeral calli. Pleural areas dark fuscous to black except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 moderately broad lateral postsutural vittae ending at or just before upper pa. bristles. Postnotum dark fuscous to black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous except fore and mid tibiae pale fuscous, hind tibiae fuscous; rows of long dark setae on dorsal surfaces

of fore femora; mid tibiae each with an apical black spur.

Wings length 7.2 mm; costal cells fulvous; microtrichia in outer $\frac{1}{3}$ to $\frac{3}{4}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and ending midway between extremities of R_{4+5} and M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except anterolateral corners dark fuscous and a broad transverse black band which narrows laterally to end before lateral margins; tergum III black; terga IV and V orange-brown except broad lateral longitudinal bands which are black on tergum IV and dark fuscous on tergum V and a broad medial longitudinal dark fuscous band over both terga. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. latissima is similar to the other species in the *bryoniae* complex in the characters listed in the comments on *B. bryoniae*. It differs from these species in having the costal band confluent with R_{4+5} , lateral postsutural vittae ending before the upper pa. bristles, abdominal tergum III black, terga IV and V orange-brown with broad lateral longitudinal bands which are black on tergum IV and dark fuscous on tergum V, a broad medial longitudinal dark fuscous band on terga IV and V joining with the lateral bands along anterior margin of tergum IV.

Bactrocera (Bactrocera) paramusae, n. sp.

(Fig. 67)

TYPE SPECIMENS

Holotype σ , PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 15.iv.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 σ (29.ii.1980), Upper Stony logging area, Bulolo, P. Daur; 2 σ (May–June, 1971) and 1 σ (August, 1971), Bubia, J. Maiyel; 12 σ (22.vi.1980), Oomsis Forestry Reserve and 2 σ (18–22.vi.1980), Gabensis, Lae–Bulolo road, R.A.I. Drew and D.W. Currey; 1 σ (12.iii.1981), Mt Missim (1450 m), A. Allison. Central District: 2 σ (9–13.iii.1970), Mt Lawes (250 m) and 1 σ (3.iii.1970), Brown River, T.L. Fenner;

1 ♂ (5.i.1974), Hombrom Bluff and 1 ♂ (19.i.1974), Crystal Rapids, J. Stibick; 1 ♂ (25.vi.1980), Bisianumu, Sogeri Plateau, 1 ♂ (25.vi.1980), Rouna Power Station No. 2, near Sogeri, 3 ♂ (25.vi.1980), Kokoda road, 3 ♂ (26.vi.1980), Moresby-Bereina road, 51 km NW Port Moresby, 1 ♂ (26.vi.1980), Moresby-Bereina road, 88 km NW Port Moresby, R.A.I. Drew and D.W. Currey. Northern District: 1 ♂ (27.v.1966), Popondetta, T.V. Bourke. Western Highlands District: 1 ♂ (20.xi.1978), Kuk Tea Research Institute, Mt Hagen, B. Thistleton. Western District: 2 ♂ (17.xi.1980), Nomad, P. Senat. Milne Bay District: 3 ♂ (4-10.viii.1980), Goodenough I., P. Spradbury. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10496) and 2 paratypes (T.10497-T.10498) in QM; 10 paratypes in ANIC; 4 paratypes in BMNH; 4 paratypes in DPI(PNG); 20 paratypes in DPI.

DISTRIBUTION

Widespread in rainforests in the Morobe Province, Central District, Northern District, Western Highlands District, Western District and Goodenough I., Papua New Guinea.

DIAGNOSIS

Medium sized species; small circular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad dark fuscous costal band and anal streak, costal cells fuscous, microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.55 mm. Frons of even width, length 1.46 times breadth; fulvous with fuscous to dark fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous to dark fuscous. Face fulvous with small circular black spots; length of face 0.43 mm. Genae fulvous, large brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 5-11 well developed black bristles each side. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.33 mm; 0.75 mm.

Thorax mesonotum black except brown markings as follows: below and behind lateral

postsutural vittae; along mesonotal suture; between humeral and notopleural calli; inside humeral calli. Pieural areas fuscous except a black area on sternopleuron and red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae narrowing posteriorly to end just before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except basal $\frac{1}{4}$ of hind tibiae pale fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.1 mm; costal cells fuscous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except dark fuscous subcostal cell, broad dark fuscous costal band confluent with R_{4+5} and ending just beyond extremity of that vein, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I pale fuscous to fuscous; tergum II orange-brown except for a narrow transverse fuscous band across anterior margin but not reaching lateral margins; terga III-V orange-brown except for an irregular transverse very pale fuscous marking across anterior margin which expands over lateral margins of tergum III. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. paramusae is similar to the species in the *bryoniae* complex in the characters listed in the comments on *B. bryoniae*. It differs from these species in having the costal band confluent with R_{4+5} , abdominal terga II-V almost uniformly orange-brown with at most pale fuscous anterolateral margins on tergum II and across anterior and lateral margins of tergum III.

Bactrocera (Bactrocera) quadrisetosa
(Bezzi), n. comb. (Fig. 68)

Chaetodacus quadrisetosus Bezzi, 1928: 102-4.

Dacus (*Zeugodacus*) *quadrisetosus* Drew, 1973: 33.

MATERIAL EXAMINED

Holotype ♂, labelled "New Hebrides, Santo, 30.Xi.1923, H.W. Simmonds", and bearing another label in Bezzi's handwriting "*Chaetodacus quadrisetosus* type male n. sp.". LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Vanuatu (formerly New Hebrides), type locality, Esperito Santo.

DIAGNOSIS

Medium sized species; large oval black facial spots present; humeral and notopleural calli yellow (anterodorsal corners of humeral calli pale fuscous); mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fuscous, microtrichia covering both costal cells; abdominal terga III-V black except for orange-brown bordering a medial longitudinal fuscous band on posterior regions of each tergum.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.48 times breadth; fulvous with pale fuscous around orbital bristles; anteromedial hump covered by a number of short dark setae; orbital bristles dark fuscous: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large oval black spots; length of face 0.48 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput fuscous, yellow along eye margins; occipital row with 7-8 strong black bristles each side. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong red-brown dorsal bristle on segment 2; length of segments: 0.23 mm; 0.35 mm.

Thorax mesonotum black except dark fuscous behind lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli (anterodorsal corners pale fuscous) notopleural calli; mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin almost straight; upper hypopleural calli (posterior apices

black); anterior $\frac{1}{2}$ lower hypopleural calli (remainder including broad ventral margins black); 2 lateral postsutural vittae narrowing slightly posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all coxae fuscous; fore, mid and apical $\frac{1}{2}$ of hind femora fuscous (basal $\frac{1}{2}$ hind femora fulvous); fore tibiae fuscous, mid tibiae fulvous, hind tibiae dark fuscous; all tarsal segments fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.5 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II with a transverse black band across anterior $\frac{1}{2}$ widening to cover lateral margins, posterior $\frac{1}{2}$ orange-brown; a narrow orange-brown band along suture between terga I and II but not reaching lateral margins; terga III-V mostly black except for orange-brown bordering a medial fuscous band on posterior areas of each tergum, on tergum V the orange-brown extends along posterior margin. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. quadrisetosa was originally described from 1 male; Drew (1973) could not locate it but it has been found in BMNH.

Although this species was placed in subgenus *Zeugodacus* by Drew (1973), this is incorrect as it possesses a short surstylus lobe and a deep concavity on the posterior margin of abdominal sternum V. It has all the characters of *Bactrocera* except for possessing 4 sc. bristles (2 in *Bactrocera*) and is provisionally placed in this subgenus. It is similar to *B. varipes* (Malloch) in the general colour patterns of the thorax, abdomen, wing and legs, the costal cell colour and microtrichia pattern. It differs from this species in having anterodorsal corners of humeral calli pale fuscous, 4 sc. bristles,

a narrow basal band on the scutellum and fore tibiae fuscous.

Bactrocera (Bactrocera) simulata
(Malloch), n. comb. (Fig. 69)

Dacus simulatus Malloch, 1939a: 241.

Dacus (Bactrocera) simulatus: Drew, 1974a: 83–5.

MATERIAL EXAMINED

Holotype ♂; a large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Mali Ali Valley, Nggela I., Solomon Islands (type locality).

NEW RECORDS: Bougainville I. (PNG); Shortland Is, New Georgia I., Guadalcanal I. (Solomon Islands) and Vanuatu (formerly New Hebrides).

DIAGNOSIS

Large species; large black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe equal in width to notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fulvous, microtrichia in outer ½ of second costal cell only; abdominal terga III–V black except for orange-brown either side of a medial longitudinal black band on tergum V and posterior ½ of tergum IV.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. simulata was described adequately by Drew (1974a). It is similar to the other species in the *bryoniae* complex in the characters listed in the comments on *B. bryoniae* but differs in having the costal band overlapping R₄₊₅ for its entire length.

Bactrocera (Bactrocera) varipes
(Malloch), n. comb. (Fig. 70)

Dacus varipes Malloch, 1939a: 240–1.

Dacus (Strumeta) varipes Drew, 1974a: 96–8.

MATERIAL EXAMINED

Holotype ♂ and 1 ♀ paratype, Tulagi, Florida I., Solomon Islands, December 1932, R.J.A.W. Lever; 1 ♂ and 1 ♀ in BMNH collected at Guadalcanal I.

LOCATION OF TYPES: Holotype and 2 ♀ paratypes in BMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Tulagi, Florida I., Solomon Islands (type locality).

NEW RECORD: Guadalcanal I. (Solomon Islands).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad black basal band; wing with a broad fuscous costal band and anal streak, costal cells fulvous, microtrichia covering both costal cells; abdominal terga mostly black. ATTRACTANT: No known record.

COMMENTS

B. varipes was described adequately by Drew (1974a). It is similar to the other species in the *bryoniae* complex in the characters listed in the comments on *B. bryoniae* but differs in having costal band confluent with R₄₊₅, abdominal terga mostly black, dense microtrichia covering all of both costal cells, legs fulvous with fore and mid femora and apical ½ of hind femora and hind tibiae fuscous.

This species was described originally from a type male, allotype and 2 female paratypes (Malloch 1939a), three of which are in BMNH.

***distincta* complex**

DEFINITION OF COMPLEX: *Bactrocera* species with infuscation on wing as a transverse band across centre in addition to costal band and anal streak, lateral postsutural vittae present, medial postsutural vitta absent, scutellum entirely yellow or with at most infuscation between apical bristles, males of some species attracted to cue lure.

Bactrocera (Bactrocera) ampla
(Drew), n. comb. (Fig. 71)

Dacus (Strumeta) amplus Drew, 1971: 55–6.

MATERIAL EXAMINED

2 ♂ paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6942) in QM.

DISTRIBUTION

Known only from Keravat, New Britain (type locality).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral calli yellow; notopleural calli dark fuscous to black; mesonotum black, mesopleural stripe reaching anterior npl. bristle, lateral

postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad dark fuscous costal band (expanding to cover apical portion of wing) and anal streak, a very broad dark fuscous band across wing recurved along CuA₁, costal cells dark fulvous, microtrichia covering all of second costal cell and outer ½ of first cell; abdominal terga II–V orange-brown except for a broad medial and 2 broad lateral longitudinal black bands joined along anterior margin of tergum II.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. ampla was described adequately by Drew (1971). It is similar to *B. decumana* (Drew) and *B. curreyi* (*distincta* complex) in possessing a broad band across centre of wing, mesonotum black with lateral postsutural vittae and humeral and notopleural calli not joined by a lateral yellow band. It differs from *B. curreyi* in possessing yellow humeral calli and from *B. decumana* in having the transverse band across wing recurved along CuA₁, lateral postsutural vittae ending at upper pa. bristles and abdomen with a broad medial and 2 broad lateral longitudinal black bands on terga II–V.

Bactrocera (Bactrocera) anomala (Drew), n. comb. (Fig. 72)

Dacus (Strumeta) anomalus Drew, 1971: 57–9.

MATERIAL EXAMINED

A series of paratypes in DPI (see DISTRIBUTION).
LOCATION OF TYPE: Holotype ♂ (T.6943) in QM.

DISTRIBUTION

Known only from Efate (type locality, Vila) and Malekula Is, Vanuatu (formerly New Hebrides).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a narrow transverse fuscous band across wing enclosing both crossveins, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V fulvous except for a broad medial and 2 irregular lateral longitudinal glossy black bands.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. anomala was described adequately by Drew (1971). It is similar to *B. atriliniellata* and *B. distincta* (Malloch) (*distincta* complex) in possessing lateral postsutural vittae ending before upper pa. bristles, a narrow transverse fuscous band across wing, mesopleural stripe not extending to humeral callus, mesonotum black with humeral and notopleural calli yellow and not joined by a lateral yellow band. It is also similar to *B. distincta* in possessing a fuscous spot on apex of scutellum. It differs from *B. atriliniellata* in having the transverse band across wing narrower and curved and the apex of the scutellum fuscous and from *B. distincta* in having costal cells fulvous, microtrichia in outer corner of second costal cell only, costal band paler towards centre of wing, legs fulvous except apical 4 segments of all tarsi fuscous and hind tibiae dark fulvous, abdominal terga fulvous with a broad medial and 2 irregularly shaped lateral longitudinal glossy black bands on terga III–V.

Bactrocera (Bactrocera) atriliniellata, n. sp. (Fig. 73)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, Lae–Bulolo road, attracted to cue lure, 22.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Central District: 1 ♂, Kokoda road, near Kokoda and 1 ♂, Bisianumu, Sogeri, 25.vi.1980, R.A.I. Drew and D.W. Currey. Morobe Province: 2 ♂♂, Mt Kaindi (1200–fb-m), 25.v.1981, A. Allison; 1 ♂, Namie Creek, Mt Kaindi (1650 m), 27.iii.1981, A. Allison; 1 ♂, Mt Missim (1550 m), 20.xi.1980, A. Allison. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10499) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 4 paratypes in DPI.

DISTRIBUTION

Known from Central District and Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, 2 narrow lateral postsutural vittae ending before upper pa. bristles, scutellum yellow; legs fulvous except hind tibiae fuscous; wing with a narrow fuscous costal band and a narrow fuscous transverse band across centre which encloses both crossveins, costal cells pale fuscous, microtrichia covering fore margin of first costal cell and most

of second costal cell; abdominal terga III–V orange-brown with a narrow medial and moderately broad lateral longitudinal dark bands on all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.45 mm. Frons of even width, length 1.57 times breadth; fulvous without dark markings or fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fulvous or fuscous. Face fulvous with medium sized oval black spots present; length of face 0.43 mm. Genae fulvous, small fuscous subocular spot present; fuscous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 6–7 well developed black bristles. Antennae with segments 1 and 2 fulvous; segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.75 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae. Pleural areas black except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, extending midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae ending before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae fuscous; remaining segments fulvous except hind tibiae fuscous; mid tibiae each with an apical black spur; rows of long dark setae on dorsal surfaces of fore femora.

Wings length 5.7 mm; costal cells pale fuscous (second cell paler), microtrichia along fore margin of first costal cell and covering most of second costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a narrow fuscous transverse band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia

around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse orange-brown band along posterior margin but not reaching lateral margins; tergum II orange-brown except for a broad transverse dark fuscous to black band across anterior $\frac{1}{2}$ and expanding over lateral margins. Terga III–V orange-brown with moderately broad lateral longitudinal bands which are dark fuscous on tergum III and fuscous on terga IV and V, and a narrow medial longitudinal band which is fuscous on terga III and IV and black on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. atriliniellata is similar to *B. anomala* (Drew) and *B. distincta* (Malloch) (*distincta* complex) in having lateral postsutural vittae ending before upper pa. bristles, transverse fuscous band across wing narrow, mesopleural stripe not extending to humeral callus, mesonotum black with lateral postsutural vittae, humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from these species in having a yellow scutellum without fuscous on apex and the transverse fuscous band across wing straight and wider (expanding to cover the outer $\frac{1}{3}$ of discoidal cell).

***Bactrocera (Bactrocera) curreyi*, n. sp.** (Figs 74–77)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western Highlands Province: Kuk Agricultural Research Station, Mt Hagen, attracted to Willison's lure, 27.xii.1978, B. Thistleton.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂ (14.vii.1957) and 1 ♂ (17.vii.1957), Bubia, J.H. Ardley; 1 ♂ (cue lure), Markham Valley road (28 km from Lae), 22.vi.1980, R.A.I. Drew and D.W. Currey; 1 ♂ (cue lure), Gabensis, Lae–Bulolo road, 18–22.vi.1980, R.A.I. Drew and D.W. Currey. East Sepik Province: 18 ♂♂, Maprik, Oct.–Dec. 1957, Malaria Control Section. Western Highlands Province: 1 ♂ (16.xii.1980) and 1 ♂ (30.xii.1980), Mt Hagen, attracted to cue lure, B. Thistleton. Central District: 1 ♂ (cue lure), Rigo, 24.vi.1980, R.A.I. Drew and D.W. Currey. Gulf Province: 1 ♂ (7.vii.1981), Aro, H. Iupa; 2 ♂♂ (17.vii.1981) and 1 ♂ (29.vii.1981), Ihu, H. Iupa. INDONESIA, Irian Jaya: 1 ♀, Ned. New Guinea, 30.x.1960, R.T. Simon Thomas. LOCATION OF TYPES: Holotype (T.10500) and 1 paratype

(T.10501) in QM; 5 paratypes in ANIC; 2 paratypes in BMNH; 1 paratype in DPI(PNG); 21 paratypes in DPI.

DISTRIBUTION

Known from Irian Jaya and the following Provinces in Papua New Guinea: Morobe, East Sepik, Western Highlands, Central and Gulf.

DIAGNOSIS

Small dark species; medium sized pear shaped black facial spots present; humeral calli fuscous; notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, 2 lateral postsutural vittae ending at upper pa. bristles, scutellum yellow; legs with femora fulvous except for fuscous on apical $\frac{1}{3}$, fore tibiae fuscous, mid tibiae pale fuscous, hind tibiae dark fuscous; wing with a narrow fuscous costal band and a broad transverse fuscous band across centre which encloses both crossveins, costal cells colourless, microtrichia in outer corner of second costal cell only; terga III–V black laterally tending dark fuscous centrally except orange-brown posterocentrally on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.6 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.5 mm. Genae fulvous, large fuscous subocular spot present; dark red-brown bristle present. Occiput pale fuscous, yellow along eye margins; occipital row with 4–9 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fuscous; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.30 mm; 0.90 mm.

Thorax mesonotum black except dark brown below lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli and above mid coxae. Yellow markings as follows: notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli (remainder including ventral margins black); 2

lateral postsutural vittae narrowing slightly posteriorly to end at upper pa. bristles. Humeral calli fuscous. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; sep. 4; all bristles well developed and dark red-brown.

Legs coxae dark fuscous; all femora fulvous except fuscous on apical $\frac{1}{3}$; fore tibiae fuscous, mid tibiae pale fuscous, hind tibiae dark fuscous; all tarsal segments fulvous; mid tibiae each with an apical black spur.

Wings length 5.9 mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band almost reaching R_{4+5} and overlapping this vein at its apex, a broad transverse fuscous band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for a broad transverse dark fuscous band across anterior $\frac{1}{2}$ and widening over lateral margins; terga III–V black laterally tending dark fuscous centrally except orange-brown posterocentrally on tergum IV and centrally on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, abdominal sternum V with a deep concavity on posterior margin.

FEMALE: As for males except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment dark fuscous, dorsoventrally flattened and tapering posteriorly in dorsal view. Apex of piercer broad, rounded at tip and curved upwards (as in *B. tinomiscii*) with 4 pairs of subapical bristles (2 large and 2 small) (Figs 75, 76). Spicules at distal end of middle segment wide with 1 central elongate broad dentation and 2–4 smaller lateral dentations (Fig. 77).

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. curreyi is similar to *B. latilineata* (*fulvicauda* complex) in general body and wing colour patterns but differs in having dark fuscous humeral calli.

This species is named after Mr D.W. Currey, Brisbane, who assisted with major collections of Dacinae in Papua New Guinea.

Bactrocera (Bactrocera) decumana
(Drew), n. comb. (Fig. 78)

Dacus (Strumeta) decumanus Drew, 1972b: 205–6.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6989) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Bougainville I. (type locality, Daru Village).

NEW RECORD: Shortland Is (Solomon Islands).

DIAGNOSIS

Large species; large oval black facial spots present; humeral calli yellow; notopleural calli black; mesonotum glossy black, mesopleural stripe extending to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad dark fuscous costal band and anal streak, a broad dark fuscous transverse band across wing, costal cells dark fulvous, microtrichia covering second costal cell and outer ½ of first cell; abdominal terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal black bands.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. decumana was described adequately by Drew (1972b). It is similar to *B. ampla* (Drew) (*distincta* complex) in possessing dark fuscous to black notopleural calli, mesonotum black with yellow humeral calli, humeral and notopleural calli not joined by a lateral yellow band and a broad transverse fuscous band across wing but differs in having the transverse band across wing not recurved along CuA₁, lateral postsutural vittae ending before upper pa. bristles, abdomen with a broad medial longitudinal black band on terga II–V and 2 broad lateral longitudinal black bands on terga III–V.

Bactrocera (Bactrocera) distincta
(Malloch), n. comb. (Figs 79–81)

Dacus distinctus Malloch, 1931: 259–60.

Strumeta distincta: Perkins, 1939: 6.

Dacus (Strumeta) distinctus: Drew, 1974a: 34–6.

MATERIAL EXAMINED

Holotype ♂; a large series of specimens in DPI (see DISTRIBUTION); 1 ♀ in BMNH labelled "Lautoka, Fiji, 28.xi.1929, H. Phillips, bred ex fruit of *Chrysophyllum cainito*".

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Widespread and generally abundant in Fiji, Western Samoa (type locality, Upolu), Eastern Samoa and Tonga.

DIAGNOSIS

Medium sized species; small fuscous facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vittae absent, scutellum yellow except fuscous on apex; wing with a broad dark fuscous costal band and anal streak, a broad transverse dark fuscous band across wing, costal cells dark fuscous, microtrichia covering second costal cell only; abdominal terga II–V orange-brown except for a broad medial and 2 broad lateral longitudinal black bands joined along anterior margin of tergum II and posterior margin of tergum V.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment black, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of oviscapae to length of tergum V 1.6:1. Apex of piercer with 1 pair of well developed subapical keels and 4 pairs of subapical bristles (Fig. 80). Spicules at distal end of middle segment, narrow, elongate, triangular and occasionally with a small lateral dentation on 1 side (Fig. 81).

HOST PLANTS

NEW RECORDS: *Burckella richii* (Sapotaceae), Tongatapu, 11.x.1974, W. Pierce; *Chrysophyllum cainito* (Sapotaceae), Fiji.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. distincta was described adequately by Drew (1974a). It is similar to *B. anomala* (Drew) and *B. atriliniellata* (*distincta* complex) in having lateral postsutural vittae ending before upper pa. bristles, transverse band across wing narrow, mesopleural stripe not extending to humeral callus, mesonotum black with humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from *B. atriliniellata* in having fuscous on apex of scutellum and transverse band across wing narrow and curved and from *B. anomala* in having costal cells dark fuscous, microtrichia covering all of second costal cell, costal band entirely dark fuscous, legs fulvous except apex of hind tibiae and

apical 4 segments of all tarsi fuscous, abdominal terga II–V with a broad transverse black band on base of tergum II and a broad medial and 2 broad lateral longitudinal black bands over all 4 terga.

***Bactrocera (Bactrocera) fergussoniensis*, n. sp.**
(Fig. 82)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Milne Bay Province: Fergusson I., 20.vi.1970, T.L. Fenner.

LOCATION OF TYPE: Holotype (T.10502) in QM.

DISTRIBUTION

Known only from Fergusson I., Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized circular black facial spots present; humeral calli yellow; notopleural calli dark fuscous to black; mesonotum black, mesopleural stripe broad reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak and a broad transverse fuscous band across centre enclosing both crossveins, costal cells fuscous with microtrichia covering second and most of first costal cell; abdominal terga II–V orange-brown except for a broad transverse black band across anterior $\frac{1}{2}$ of tergum II and a broad medial and 2 broad lateral longitudinal fuscous to dark fuscous bands over all 4 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.75 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized circular black spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; fulvous bristle present. Occiput black dorsally, fulvous ventrally and along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong fulvous dorsal bristle on segment 2; length of segments: 0.25 mm; 0.38 mm.

Thorax mesonotum and pleural areas black without pale markings. Yellow markings as follows: humeral calli; broad mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to

sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 moderately broad parallel sided lateral postsutural vittae ending at upper pa. bristles. Notopleural calli dark fuscous to black. Postnotum black. Scutellum yellow except for broad black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.8 mm; costal cells fuscous; microtrichia covering second and most of first costal cell; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and overlapping this vein at its apex to end between extremities of R_{4+5} and M, broad transverse fuscous band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse orange-brown band across posterior margin but not reaching lateral margins; terga II–V orange-brown except for a broad transverse black band across anterior $\frac{1}{2}$ of tergum II, a broad medial and 2 broad lateral longitudinal bands which are dark fuscous on posterior $\frac{1}{2}$ of tergum II, all of tergum III and fuscous on terga IV and V. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. fergussoniensis is similar to *B. pseudodistincta* (Drew) and *B. propedistincta* (*distincta* complex) in possessing coloured costal cells, costal band confluent with R_{4+5} , lateral postsutural vittae ending at upper pa. bristles and mesopleural stripe not extending to humeral callus. It differs from *B. propedistincta* in having a distinct pattern of longitudinal dark bands on abdomen and from *B. pseudodistincta* in having fuscous costal cells, microtrichia covering second and most of first costal cell; abdomen with broad lateral dark margins on terga I–V.

***Bactrocera (Bactrocera) furvilineata*, n. sp.**
(Fig. 83)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, attracted to cue lure, 22.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Central District: 3 ♂♂ (25.vi.1980), Kokoda road, near Kokoda; 1 ♂ (25.vi.1980) Bisianumu, near Sogeri; 1 ♂ (24.vi.1980), Rigo road, 32 km SE Port Moresby; 1 ♂ (26.vi.1980), Moresby-Bereina road, 51 km NW Port Moresby; all attracted to cue lure and collected by R.A.I. Drew and D.W. Currey; 1 ♂, Mt Lawes, attracted to Willison's lure, 9-13.iii.1970, T.L. Fenner. Morobe Province: 7 ♂♂ (22.vi.1980), Oomsis Forestry Reserve, R.A.I. Drew and D.W. Currey; 1 ♂ (22.vi.1980), Markham Valley road, 28 km from Lae, R.A.I. Drew and D.W. Currey; 1 ♂ (29.iii.1981), Namie Creek, Mt Kaindi (1650 m), A. Allison; all attracted to cue lure. Western Highlands Province: 1 ♂ (17.xi.1981), Kuk A.R.I., Mt Hagen, attracted to cue lure, B. Thistleton.

LOCATION OF TYPES: Holotype (T.10503) and 1 paratype (T.10504) in QM; 4 paratypes in ANIC; 2 paratypes in BMNH; 1 paratype in DPI(PNG); 9 paratypes in DPI.

DISTRIBUTION

Known from Central District, Morobe and Western Highlands Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching almost to anterior npl. bristles, 2 broad lateral postsutural vittae ending at upper pa. bristles, scutellum yellow; legs with all femora orange-brown tending pale fuscous on apical $\frac{1}{3}$, fore and mid tibiae pale fuscous, wing with a narrow costal band and a narrow transverse fuscous band across centre enclosing both crossveins, hind tibiae fuscous, costal cells fulvous, microtrichia covering most of second costal cell; abdominal terga II-V orange-brown except for a narrow transverse dark fuscous band across anterior margin of tergum II and with a broad medial and 2 lateral longitudinal dark bands on terga III-V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.5 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous.

Face fulvous with medium sized oval black spots present; length of face 0.48 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 5-7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista dark fuscous (fulvous basally); length of segments: 0.20 mm; 0.35 mm; 0.90 mm.

Thorax mesonotum black except dark brown below and behind lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae ending at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae orange-brown, mid and hind coxae fuscous; all femora orange-brown, tending pale fuscous on apical $\frac{1}{3}$; fore and mid tibiae pale fuscous, hind tibiae fuscous; all tarsi fulvous; rows of long dark setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.5 mm; costal cells pale fuscous, microtrichia covering most of second costal cell; remainder of wings colourless except fuscous subcostal cell; narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a narrow transverse fuscous band across centre of wing and enclosing both crossveins, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; terga II-V orange-brown except for a narrow transverse dark fuscous band across anterior margin of tergum II, but not reaching lateral margins, anterolateral corners of tergum II dark fuscous, lateral margins of tergum III dark fuscous, lateral margins of terga IV and V pale fuscous to fuscous, a broad medial longitudinal band which is dark fuscous on tergum II and black on terga III-V. A pair of oval fuscous shining spots on tergum V. Posterior lobe of

surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. furvilineata is similar to *B. latilineata* (*fulvicauda* complex) and *B. rhabdota* (*distincta* complex) in possessing costal band overlapping R_{2+3} but not confluent with R_{4+5} , lateral postsutural vittae ending at upper pa. bristles, narrow transverse fuscous band across wing, mesonotum with humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from these species in having costal cells pale fuscous, transverse band across wing narrow and covering only outer corner of discoidal cell, abdominal terga II–V orange-brown except for a broad medial longitudinal dark band over all 4 terga and 2 moderately broad lateral longitudinal bands which are dark fuscous on tergum III and fuscous to pale fuscous on terga IV and V.

Bactrocera (*Bactrocera*) *morobiensis*, n. sp.

(Fig. 84)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Gabensis, Lae–Bulolo road, attracted to cue lure, 18–22.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 2 ♂♂ (cue lure) and 4 ♂♂ (Willison's lure), Bubia, September–October 1971, K. Gorea; 3 ♂♂ (cue lure), Bubia, May–June 1971, J. Maiyel; 1 ♂ (Willison's lure), Morobe District, August 1971, J. Maiyel; 1 ♂ (cue lure), Gabensis, Lae–Bulolo road, 18–22.vi.1980, R.A.I. Drew and D.W. Currey; 1 ♂ (cue lure), Oomsis Forestry Reserve, 22.vi.1980, R.A.I. Drew and D.W. Currey. East Sepik Province: 1 ♂, Maprik, Oct.–Dec.1957, Malaria Control Section.

LOCATION OF TYPES: Holotype (T.10505) and 1 paratype (T.10506) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 8 paratypes in DPI.

DISTRIBUTION

Known from the Morobe and East Sepik Provinces, Papua New Guinea.

DIAGNOSIS

Pale coloured medium sized species; small irregularly oval pale fuscous to dark fuscous facial spots present; humeral and notopleural calli yellow and connected by a broad yellow band; mesonotum red-brown with irregular fuscous markings present, mesopleural stripe reaching almost to anterior npl. bristle, 2 lateral postsutural vittae ending before upper pa. bristles, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow costal band and a broad transverse fuscous band across centre enclosing both crossveins, costal cells

fulvous, microtrichia in outer corner of second costal cell only; abdominal terga II–V orange-brown with shining spots on tergum V fuscous.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.57 times breadth; fulvous with pale fuscous ventrally; anteromedial hump covered by short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous with small irregularly oval spots which vary in colour from pale fuscous to dark fuscous; length of face 0.55 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 5–8 well developed bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.35 mm; 0.85 mm.

Thorax mesonotum red-brown with irregular fuscous markings between humeral and notopleural calli and inside lateral postsutural vittae. Pleural areas pale fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; broad band connecting humeral and notopleural calli; broad mesopleural stripe reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 parallel sided lateral postsutural vittae ending before upper pa. bristles. Postnotum pale fuscous. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 6.7 mm; costal cells fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell; narrow fuscous costal band almost reaching R_{4+5} and crossing this vein at its apex, a broad transverse fuscous band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I pale fuscous with a narrow transverse orange-brown band across posterior

margin; terga II–V orange-brown. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. morobiensis is similar to *B. unifasciata* (Malloch) (*distincta* complex) in having the humeral and notopleural calli joined by a lateral yellow band but differs from this species in having the mesonotum mostly red-brown and abdominal terga mostly orange-brown.

Bactrocera (Bactrocera) oblineata, n. sp.

(Fig. 85)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, attracted to cue lure, 22.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 3 ♂♂ (cue lure), Markham Valley road (28 km from Lae), 22.vi.1980, R.A.I. Drew and D.W. Currey; 3 ♂♂ (cue lure), Oomsis Forestry Reserve, 22.vi.1980, R.A.I. Drew and D.W. Currey; 3 ♂♂ (30.x.1980) and 1 ♂ (6.xi.1980), Mt Missim (1100 m), attracted to cue lure, A. Allison; 1 ♂, Mt Missim (1250 m) and 1 ♂, Mt Missim (1350 m), 20.xi.1980, attracted to cue lure, A. Allison. Milne Bay Province: 1 ♂, Gurney, 16–23.vii.1977, A. Eteboyo; 1 ♂ (Dak Pot trap), Waigani, 16–23.vii.1977, A. Eteboyo. Central Province: 2 ♂♂ (cue lure), Cape Rodney, 9–16.vii.1977, A. Eteboyo; 1 ♂ (cue lure), Kokoda road, near Kokoda, 25.vi.1980, R.A.I. Drew and D.W. Currey.

LOCATION OF TYPES: Holotype (T.10507) and 1 paratype (T.10508) in QM; 4 paratypes in ANIC; 2 paratypes in BMNH; 1 paratype in DPI (PNG); 9 paratypes in DPI.

DISTRIBUTION

Known from the Central, Milne Bay and Morobe Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, 2 lateral postsutural vittae ending at upper pa. bristles, scutellum yellow; legs with femora fulvous except apical $\frac{1}{3}$ of each fuscous, fore tibiae fuscous, mid tibiae fulvous except basal $\frac{1}{3}$ fuscous, hind tibiae dark fuscous; wing with a broad costal band confluent with R_{4+5} and a broad transverse fuscous band across centre which encloses both crossveins, costal cells colourless, microtrichia in outer corner of second costal cell

only; abdominal terga III–V black except orange-brown posterocentrally on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.45 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized pear shaped black spots present; length of face 0.4 mm. Genae fulvous, black subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 3–8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.11 mm; 0.33 mm; 0.85 mm.

Thorax mesonotum black except dark brown below and behind lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli (remainder including broad ventral margins black); 2 lateral postsutural vittae narrowing slightly posteriorly to end at upper pa. bristles. Postnotum black. Scutellum yellow except for black basal band of medium width. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all femora fulvous with apical $\frac{1}{3}$ fuscous; fore tibiae fuscous, mid tibiae fulvous with basal $\frac{1}{3}$ fuscous, hind tibiae dark fuscous; all tarsi fulvous; mid tibiae each with an apical black spur; rows of long black setae on dorsal surfaces of fore femora.

Wings length 5.9 mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell; broad fuscous costal band confluent with R_{4+5} and overlapping this vein at its apex (there is a pale fuscous stripe above R_{4+5} distal to r–m crossvein); a broad transverse fuscous band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia

around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II fulvous with a broad transverse dark fuscous band across anterior $\frac{1}{2}$ widening to cover lateral margins; terga III–V black except orange-brown posterocentrally on tergum IV and centrally on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. oblineata is similar to *B. fergussoniensis*, *B. propedistincta* and *B. pseudodistincta* (Drew) (*distincta* complex) in possessing the costal band confluent with R_{4+5} , lateral postsutural vittae ending at the upper pa. bristles, transverse band across wing narrow, mesopleural stripe not extending to humeral callus, mesonotum black with humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from these species in having colourless costal cells and abdominal terga black except orange-brown posterocentrally on terga IV and V.

***Bactrocera (Bactrocera) propedistincta*, n. sp.** (Fig. 86)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Bubia, near Lae, 19.vii.1957, J.H. Ardley.

Paratype, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Lae (Blevins Block), 25.vii.1957, J.H. Ardley.

LOCATION OF TYPES: Holotype (T.10509) in QM; paratype in DPI.

DISTRIBUTION

Known only from near Lae, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized circular black facial spots present; humeral calli yellow; apical $\frac{1}{2}$ notopleural calli yellow (remainder fuscous); mesonotum black; mesopleural stripe of medium width reaching to the anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent; scutellum yellow; legs with all segments fulvous; wing with a broad fuscous costal band confluent with R_{4+5} and broad fuscous anal streak, costal cells fuscous with microtrichia covering all of second costal cell and outer $\frac{1}{2}$ of first costal cell; abdominal terga I–V uniformly orange-brown with at most a very pale

and narrow medial longitudinal band on terga III and IV.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.9 mm. Frons narrowing slightly posteriorly, length 1.76 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized circular black spots; length of face 0.48 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.35 mm; 0.88 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, around mesonotal suture and between humeral and notopleural calli. Pleural areas black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; apical $\frac{1}{2}$ notopleural calli (basal $\frac{1}{2}$ fuscous); medium sized mesopleural stripe, reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae ending at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.7 mm; costal cells fuscous; microtrichia covering all of second costal cell and outer $\frac{1}{2}$ of first costal cell; remainder of wings colourless except for fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and overlapping this vein towards its extremity, a broad transverse fuscous band across centre of wing and enveloping both crossveins, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than

long. Terga I–V uniformly orange-brown with at most a very pale fuscous and narrow medial longitudinal band on terga III and IV. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a very deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. propedistincta is similar to *B. fergussoniensis* and *B. pseudodistincta* (Drew) (*distincta* complex) in possessing coloured costal cells, costal band confluent with R_{4+5} , lateral postsutural vittae ending at upper pa. bristles, transverse band across wing narrow, mesopleural stripe not extending to humeral callus, humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from these species in having the abdominal terga uniformly orange-brown with at most a very pale fuscous and narrow medial longitudinal band on terga III and IV.

Bactrocera (Bactrocera) pseudodistincta (Drew), n. comb. (Fig. 87)

Dacus (Strumeta) pseudodistinctus Drew, 1971: 79–81.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6957) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: New Britain (type locality, Keravat), New Ireland and Lihir I.

NEW RECORDS: Papua New Guinea: Central District (Mt Lawes, 250 m); Morobe Province, May 1971, J. Maiyel. Torres Strait islands: Boigu, Darnley, Saibai, Yam (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; small black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad costal band and anal streak, a broad transverse fuscous band across wing, first costal cell fulvous, second costal cell fuscous, microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdominal terga II–V fulvous except for a broad medial longitudinal dark fuscous band over all 4 terga and 2 broad lateral longitudinal fuscous bands over terga III–V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. pseudodistincta was described adequately by Drew (1971). It is similar to *B. fergussoniensis* and *B. propedistincta* (*distincta* complex) in having coloured costal cells, costal band confluent with R_{4+5} , lateral postsutural vittae ending at upper pa. bristles, transverse band across wing narrow, mesopleural stripe not extending to humeral callus, humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from *B. propedistincta* in having a distinct pattern of longitudinal dark bands on the abdomen and from *B. fergussoniensis* in having first costal cell fulvous and second costal cell fuscous, microtrichia covering outer $\frac{1}{2}$ of second costal cell only and abdomen with broad lateral dark margins on terga III–V.

***Bactrocera (Bactrocera) rhabdota*, n. sp.** (Fig. 88)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central District: Kokoda road, near Kokoda, attracted to cue lure, 25.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Central District: 10 ♂♂, Kokoda road, near Kokoda, 25.vi.1980, R.A.I. Drew and D.W. Currey; 4 ♂♂, Bisianumu, Sogeri, 25.vi.1980, R.A.I. Drew and D.W. Currey. Morobe Province: 1 ♂, Upper Stony logging area, Bulolo, 18.ii.1980, P. Daur; 1 ♂, Mt Susu, Bulolo, 5.v.1980, P. Daur; 1 ♂, Upper Manki logging area, Bulolo, 15.iv.1980, P. Daur; 1 ♂, Kunai Creek, Mt Kaindi (1450 m), 10.xi.1980, A. Allison; 1 ♂ (1100 m) and 1 ♂ (1550 m), Mt Missim, 30.x.1980, A. Allison; 1 ♂ (1200 m), 1 ♂ (1340 m) and 1 ♂ (1350 m), Mt Missim, 20.xi.1980, A. Allison; 1 ♂ (1550 m) Mt Missim, 11.xii.1980, A. Allison. Western Highlands Province: 1 ♂ (6.x.1980), 1 ♂ (28.x.1980), 1 ♂ (16.xii.1980), Mt Hagen, B. Thistleton. All above paratypes attracted to cue lure. East Sepik Province: 7 ♂♂, Maprik, Oct.–Dec.1957, Malaria Control Centre.

LOCATION OF TYPES: Holotype (T.10510) and 2 paratypes (T.10511–T.10512) in QM; 8 paratypes in ANIC; 2 paratypes in BMNH; 2 paratypes in DPI(PNG); 20 paratypes in DPI.

DISTRIBUTION

Known from the following Provinces in Papua New Guinea: Central, Morobe, Western Highlands and East Sepik.

DIAGNOSIS

Medium sized species; small to medium oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching almost to anterior npl. bristle, 2 lateral postsutural vittae ending at upper pa. bristles, scutellum yellow; legs fulvous except hind tibiae fuscous; wing with a narrow costal band and a broad transverse fuscous band across centre of

wing enclosing both crossveins, costal cells fulvous, microtrichia in outer corner of first costal cell and most of second costal cell; abdominal terga III–V orange-brown with at most a small fuscous spot on anterolateral margins of tergum III and a narrow medial longitudinal fuscous to black band on either terga IV and V or terga III–V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.5 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small to medium oval black spots present; length of face 0.5 mm. Genae fulvous, fuscous subocular spot present; fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.89 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae. Pleural areas black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae narrowing over posterior 1/2 to end at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid and hind coxae fuscous; remaining segments fulvous except hind tibiae fuscous; mid tibiae each with an apical black spur.

Wings length 5.9 mm; costal cells fulvous (second cell slightly paler); microtrichia in outer corner of first costal cell and most of second costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a broad transverse fuscous band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia

around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a narrow fuscous transverse band along anterior margin but not reaching lateral margins. Terga III–V orange-brown with no dark markings or with dark markings as follows: a small fuscous spot on anterolateral margins of tergum III; a narrow medial longitudinal fuscous to black band of varying development on terga IV and V or terga III–V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. rhabdota is similar to *B. furvilineata* (*distincta* complex) and *B. latilineata* (*fulvicauda* complex) in possessing the costal band overlapping R_{2+3} but not confluent with R_{4+5} , lateral postsutural vittae ending at upper pa. bristles, transverse band across wing narrow, mesopleural stripe not extending to humeral callus, humeral and notopleural calli yellow and not joined by a lateral yellow band. It differs from *B. furvilineata* in having costal cells fulvous and transverse band across wing expanding to cover outer 1/3 of discoidal cell and from *B. latilineata* in having the abdominal terga mostly orange-brown with occasional small fuscous anterolateral corners on tergum III and an irregular narrow fuscous band on terga III–V or IV and V.

Bactrocera (Bactrocera) unifasciata (Malloch), n. comb. (Fig. 89)

Dacus unifasciatus Malloch, 1939a: 233–4.

Dacus (Strumeta) unifasciatus Drew, 1974a: 93–4.

MATERIAL EXAMINED

Holotype ♂, Kaukau, Guadalcanal I., Solomon Islands, August 1934, R.A. Lever.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Kaukau, Guadalcanal I., Solomon Islands (type locality).

DIAGNOSIS

Medium sized species; small oval black facial spots present; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum black, mesopleural stripe slightly wider than

notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a broad transverse fuscous band across wing, costal cells pale fulvous, microtrichia covering second costal cell only; abdominal terga III–V orange-brown with a medial and 2 lateral longitudinal black bands.

ATTRACTANT: No known record.

COMMENTS

B. unifasciata was described adequately by Drew (1974a). It is similar to *B. morobiensis* (*distincta* complex) in having the humeral and notopleural calli joined by a lateral yellow band but differs in having the mesonotum mostly black and abdominal terga III–V orange-brown with a broad medial and 2 moderately broad lateral longitudinal black bands over all 3 terga.

dorsalis complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for a narrow costal band (not confluent with R_{4+5}) and anal streak, costal cells colourless or with a pale tint and without dense microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with narrow dark basal band, mesonotum black (or with a distinct black lanceolate pattern), abdominal terga III–V with a medial longitudinal dark band and variable dark patterns on lateral margins, males attracted to methyl eugenol.

Bactrocera (*Bactrocera*) *abdolongi* (Drew), n. comb. (Fig. 90)

Dacus (*Strumeta*) *abdolongi* Drew, 1971: 50–2.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6939) in QM.

DISTRIBUTION

Keravat, New Britain (type locality).

DIAGNOSIS

Large species; large oval black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and broad fuscous anal streak, costal

cells extremely pale fulvous, microtrichia in outer corner of second costal cell only; abdomen elongate-oval, terga II–V orange-brown with a narrow medial longitudinal fuscous band over all 4 terga and 2 lateral longitudinal fuscous bands over terga III–V.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. abdolongi was described adequately by Drew (1971). It is similar to *B. dapsiles* (*dorsalis* complex) and *B. laticosta* (*aemula* complex) in possessing a mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, costal cells with a pale fulvous tint, lateral postsutural vittae ending at or behind upper pa. bristle, mesonotum black and wings colourless except for costal band and anal streak. It differs from *B. laticosta* in having costal band moderately broad reaching midway between R_{2+3} and R_{4+5} and from *B. dapsiles* in having abdomen elongate-oval, costal band of uniform width, lateral postsutural vittae parallel sided and ending behind upper pa. bristles and abdomen with a narrow medial longitudinal pale fuscous band on terga II–V and 2 moderately broad lateral longitudinal pale fuscous bands on terga III–V.

Bactrocera (*Bactrocera*) *cacuminata* (Hering), n. comb. (Figs 91–93)

Strumeta cacuminata Hering, 1941a: 46–7; May, 1963: 44–5, 50, 69–70.

Dacus tryoni var. *solani* Jarvis, 1922: 247 (nomen nudum).

Chaetodacus dorsalis: Tryon (nec. Hendel), 1927: 194–6 (misidentification).

Chaetodacus dorsalis var. *major* Tryon, 1927: 195 (nomen nudum).

Strumeta solani Perkins and May, 1949: 14–6; Hardy, 1951: 149 (syn.).

Dacus (*Strumeta*) *cacuminatus*: Hardy, 1951: 149–52.

Dacus (*Bactrocera*) *cacuminatus*: Drew, 1982: 24–6.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Hering's and Tryon's type specimens.

LOCATION OF TYPES: *S. cacuminata*, lectotype ♂ and paralectotype ♀ in BMNH; *D. tryoni* var. *solani*, no types designated; *C. dorsalis* var. *major*, 1 ♂ and 1 ♀ syntype (D. 3126) in QM; *S. solani*, 2 ♂ and 2 ♀ syntypes (D. 3125, "plesiotypes" of *C. dorsalis* Tryon) in QM.

DISTRIBUTION

Occurs in large populations throughout eastern Australia from Cape York in the north to the East Gippsland district in the south; type locality, Brisbane.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dark red-brown with a dark fuscous to black lanceolate pattern, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except broad dark fuscous to black medial and lateral longitudinal bands joined along anterior margin of tergum III.

DESCRIPTION

FEMALE: Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.93:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (Fig. 92). Spicules at distal end of middle segment of medium width, scale-like, with a row of 9–15 small thin dentations of approximately equal size (Fig. 93).

HOST PLANTS

NEW RECORDS: *Elaeocarpus* sp. (Elaeocarpaceae) and *Disoxylum* sp. (Meliaceae), Cairns, north Queensland, Dec. 1976, B. McCulloch.

ATTRACTANT: Methyl eugenol.

COMMENTS

Originally, Hering (1941a) designated a male and female type to be placed in HNHM. These specimens are in BMNH: type female labelled "Stanthorpe, Q., 10.3.25, F.A. Perkins"; type male labelled "Brisbane, Q., 10.10.33, F.A. Perkins". They each bear another label "Purch. from E.M. Hering, B.M. 1965–270". Because Hering did not designate a holotype, I designate the male as lectotype and the female as paralectotype.

Tryon (1927) mentioned a variety *major* but did not describe it. Therefore the name is unavailable (Article 12c of the International Code of Zoological Nomenclature). Perkins and May (1949) proposed the name *S. solani* for the misidentified *C. dorsalis* Tryon (nec. Hendel), but described it as a new species. Although no types were designated, Tryon's "plesiotypes" of *C. dorsalis* are part of their type series (Article 72b (ii) of the International Code of Zoological Nomenclature).

May (1953) recorded *B. cacuminata* from capsicum and tomato, the latter based on a few specimens on 1 occasion. Since no further

specimens have been obtained in Australia for these or other commercial fruits, these 2 records remain doubtful. Drew (1982) listed this species as economic on the basis of May's (1953) record.

B. cacuminata was described adequately by Hardy (1951) and Drew (1982). It is similar to *B. opiliae* (Drew and Hardy) (*dorsalis* complex) in having the mesonotum not entirely black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, costal cells colourless with microtrichia in outer corner of second costal cell only and lateral postsutural vittae ending at upper pa. bristles. It differs from this species in having the costal band confluent with R_{2+3} and widening slightly between extremity of R_{2+3} and apex of wing. This is the only South Pacific species that has a costal band that is identical to *B. dorsalis* (Hendel)—oriental fruit fly.

***Bactrocera (Bactrocera) dapsiles*, n. sp.**
(Figs 94–96)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Kaindi (1800 m), attracted to methyl eugenol, 16.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 6 ♂♂, Wau Ecology Institute (1600 m), attracted to methyl eugenol, 16.vi.1980, R.A.I. Drew and D.W. Currey; 2 ♂♂ (25.iii.1980), 2 ♂♂ (28.iii.1980), 1 ♂ (6.iv.1980), Upper Manki logging area, Bulolo, attracted to methyl eugenol, P. Daur; 2 ♂♂ (12.ii.1980) and 1 ♂ (7.iii.1980), Upper Stony logging area, Bulolo, attracted to methyl eugenol, P. Daur; 1 ♂ (26.v.1980) and 1 ♂ (2.vi.1980), Gumi logging area, Watut, attracted to methyl eugenol, P. Daur; 1 ♀ and 2 ♂♂ (17.vi.1980), Bulolo, hand collected on *Solanum mauritianum*, R.A.I. Drew and D.W. Currey; 2 ♀♀ (21.vi.1980), Bulolo, bred ex fruit of *Solanum mauritianum*, D.W. Currey; 3 ♀♀ and 1 ♂ (19.vi.1980), Bulolo, bred ex fruit of *Solanum mauritianum*, J. Simpson. Eastern Highlands Province: 3 ♂♂ (29.xi.1976), Highlands Agricultural Experiment Station, Aiyura (1550 m), B. Keoro; 1 ♂ (29.xi.1976) and 3 ♂♂ (30.xi.1976), Highlands Agricultural Experiment Station, Aiyura (1550 m), E.S.C. Smith. Western Highlands Province: 1 ♂ (13.i.1980), Mt Hagen, attracted to methyl eugenol, B. Thistleton. Simbu Province: 2 ♂♂ and 3 ♀♀ (9.v.1984), Karimui, hand collected on cardamom, J.W. Ismay.

LOCATION OF TYPES: Holotype (T.10513) and 2 paratypes (T.10514–T.10515) in QM; 8 paratypes in ANIC; 2 paratypes in BMNH, 2 paratypes in DPI(PNG); 24 paratypes in DPI.

DISTRIBUTION

Occurs in large populations at altitudes below 1800 m. It is known from the following Provinces in Papua New Guinea: Morobe, Eastern Highlands, Western Highlands and Simbu.

DIAGNOSIS

Medium sized species; small to medium irregularly oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae ending at upper pa. bristles, scutellum yellow; legs fulvous except a fuscous tint on basal ends of fore and mid tibiae and fuscous hind tibiae; wing with a dark fuscous costal band (overlapping R_{2+3}) and a narrow fuscous anal streak, costal cells very pale fulvous with microtrichia in outer corner of second costal cell; abdominal terga III–V orange-brown with a moderately broad medial longitudinal black band and either (1) anterolateral corners of tergum III dark fuscous and anterolateral corners of terga IV and V pale fuscous or (2) broad lateral black margins on tergum III which meet along anterior margin and with lateral margins of terga IV and V dark fuscous.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.45 mm. Frons narrowing slightly posteriorly, length 1.46 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small to medium irregularly oval black spots; length of face 0.48 mm. Genae fulvous, dark subocular spot present; red-brown to black bristle present. Occiput pale fuscous to fuscous, yellow along eye margins; occipital row with 4–7 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.75 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae. Pleural areas black except brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior $\frac{3}{4}$ lower hypopleural calli (remainder black); 2 moderately broad lateral postsutural vittae narrowing slightly posteriorly to end at upper pa. bristles. (In a few specimens the vittae end just before the upper pa. bristles.) Postnotum black. Scutellum yellow except for a narrow black basal band. Bristles: sc. 2; prsc. 2;

pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs coxae fuscous; all other segments fulvous except a fuscous tint on basal ends of fore and mid tibiae, fuscous on hind tibiae; mid tibiae each with an apical black spur; rows of long dark setae on dorsal surfaces of fore femora and long pale setae on ventral surfaces of fore femora

Wings length 6.1 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except dark fuscous subcostal cell, narrow dark fuscous costal band overlapping R_{2+3} and widening around apex of R_{4+5} to end between extremities of R_{4+5} and M, a narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown with anterolateral corners fuscous to dark fuscous and with or without a narrow transverse dark fuscous to black band across anterior margin but not reaching lateral margins. Terga III–V vary between 2 extremes: (1) orange-brown with a moderately broad medial longitudinal black band, anterolateral corners of tergum III dark fuscous, anterolateral corners of terga IV and V pale fuscous; (2) orange-brown with a moderately broad medial longitudinal black band, broad lateral black margins on tergum III which meet along anterior margin, lateral margins of terga IV and V dark fuscous. A pair of oval shining spots which vary from orange-brown to fuscous on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment of ovipositor red-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.63:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 95). Spicules at distal end of middle segment of medium width with 8–12 small dentations of uneven length (Fig. 96).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. dapsiles is similar to *B. abdolonginqua* (Drew) (*dorsalis* complex) in having the costal band reaching midway between R_{2+3} and R_{4+5} ,

mesopleural stripe extending midway between anterior margin of notopleural callus and anterior npl. bristle, costal cells with a pale fulvous tint and lateral postsutural vittae ending at or behind upper pa. bristle. It differs from this species in possessing an oval shaped abdomen, abdominal terga III–V with a broad medial and 2 broad lateral longitudinal dark bands which are joined along anterior margin of tergum III, costal band expanded at apex and lateral postsutural vittae narrowing to end at the upper pa. bristle.

***Bactrocera (Bactrocera) diallagma*, n. sp.**
(Fig. 97)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Lae side of escarpment, 69 km from Lae on Lae–Bulolo road, attracted to methyl eugenol, 19.vi.1980, R.A.I. Drew and D.W. Currey.

Paratype, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Mt Missim (1650 m), attracted to methyl eugenol, 30.x.1980, A. Allison.

LOCATION OF TYPES: Holotype (T.10516) in QM; paratype in DPI.

DISTRIBUTION

Known only from Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; small circular black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe equal in width to notopleural callus, lateral postsutural vittae narrow and ending just before upper pa. bristles, scutellum yellow; legs fuscous except tarsi fulvous; wing with a narrow fuscous costal band and anal streak, legs fuscous except tarsi fulvous; costal cells very pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V dark orange-brown except for a very narrow transverse dark fuscous band across anterior margin of tergum III, lateral margins of tergum III fuscous and a narrow medial longitudinal fuscous band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.55 mm. Frons of even width, length 1.46 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with small circular black spots; length of face 0.45 mm. Genae fulvous, fuscous subocular spot present; small red-

brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 5–7 well developed bristles. Antennae with segments 1 and 2 red-brown, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.38 mm; 0.78 mm.

Thorax mesonotum black except dark brown below lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; narrow mesopleural stripe, equal in width to notopleural callus dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing slightly posteriorly to end just before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fuscous except tarsi fulvous; mid tibiae each with an apical black spur.

Wings length 6.1 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings with a fulvous tint except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II dark orange-brown except anterolateral corners fuscous and a narrow dark fuscous transverse band across anterior margin which ends before lateral margins; terga III–V dark orange-brown except for a very narrow dark fuscous transverse band across anterior margin of tergum III and broadening into anterolateral corners, lateral margins of tergum III fuscous, a narrow medial longitudinal fuscous band over all 3 terga. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. diallagma is similar to *B. mimulus (dorsalis complex)* and *B. aemula*, *B. consectorata*, *B.*

fuliginus (Drew and Hancock) and *B. inconstans* (*aemula* complex) in possessing coloured costal cells and lateral postsutural vittae ending before upper pa. bristles. It differs from these species in having a narrow mesopleural stripe equal in width to notopleural callus.

Bactrocera (Bactrocera) endiandrae

(Perkins and May), n. comb. (Figs 98–100)

Strumeta endiandrae Perkins and May, 1949: 9–10; May, 1953: 16, 1963: 50, 74.

Dacus (Strumeta) endiandrae: Hardy, 1951: 152–4; Drew, 1974a: 36.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); type series of Perkins and May.

LOCATION OF TYPES: Lectotype ♀ (T.5251) and 1 paralectotype ♂ (T.5252) in QM; 147 paralectotypes in UQ.

DISTRIBUTION

PREVIOUSLY RECORDED: Occurs in large populations in the rainforests of eastern Queensland (type locality, Cairns) and north-east New South Wales. Papua New Guinea at Morehead, Western District (Drew, 1974a).

NEW RECORDS: Papua New Guinea, Central Province: Sogeri, 5.x.1973, J. Stibick. Torres Strait islands: Badu, Boigu, Horn, Saibai, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Small to medium sized species; small oval to circular black facial spots present; humeral and notopleural calli yellow; legs fulvous except hind tibiae fuscous; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, legs fulvous except hind tibiae fuscous; costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a transverse dark fuscous to black band across base of tergum III, a medial longitudinal dark fuscous to black band on terga III–V and moderately broad lateral longitudinal bands which are generally fuscous to pale fuscous but may be darker.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.55 times breadth; fulvous with

fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small circular to oval black spots; length of face 0.43 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 3–7 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.73 mm.

Thorax mesonotum dull black except brown below and behind lateral postsutural vittae, around mesonotal suture, between humeral and notopleural calli, inside humeral calli. Pleural areas fuscous to dark fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae narrowing slightly posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for anterolateral corners dark fuscous and a narrow dark fuscous transverse band across anterior area of tergum; terga III–V orange-brown except for a transverse dark fuscous to black band across base of tergum III, a medial longitudinal fuscous to black band on terga III–V and moderately broad lateral longitudinal bands which

are generally fuscous to pale fuscous but may be darker. Basal segment of ovipositor orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 0.48:1. Apex of piercer needle shaped with 4 pairs of small subapical bristles (Fig. 99). Spicules at distal end of middle segment of medium width with 8–10 dentations of uneven size (Fig. 100).

MALE: As for female except dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development; pecten present on abdominal tergum III.

HOST PLANTS

NEW RECORD: *Maranthes corymbosa* (Chrysobalanaceae), Bamaga, Cape York, Queensland, G.M. Sanewski.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. endiandrae is similar to *B. aemula*, *B. consectorata*, *B. fuliginus* (Drew and Hancock), *B. inconstans* (*aemula* complex) and *B. diallagma* and *B. mimulus* (*dorsalis* complex) in possessing lateral postsutural vittae ending before upper pa. bristles. It differs from all these species in having colourless costal cells. Perkins and May did not define type specimens in their description, based on "over one hundred specimens ...". Two specimens each labelled holotype in QM can be identified from label data as part of the original series: 1 female (T.5251), Cairns, Queensland, 16.x.1937, F.A. Perkins, bred from *Endiandra discolor*; 1 male (T.5252), Cairns, Queensland, 16.x.1937, F.A. Perkins, bred from *Endiandra discolor*. The remainder of the type series is in UQ. I designate the female (T.5251) as lectotype and the remaining specimens as paralectotypes.

***Bactrocera (Bactrocera) mimulus*, n. sp.** (Fig. 101)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute, attracted to methyl eugenol, 31.iii. – 11.iv.1965, E.N. Marks.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 6 ♂♂ (18–22.vi.1980), Gabensis (on Lae–Bulolo road), R.A.I. Drew and D.W. Currey; 2 ♂♂ (12.ii.1980) and 1 ♂ (22.ii.1980), Upper Stony logging area, Bulolo, P. Daur; 1 ♂ (26.v.1980), Gumi Watut, P. Daur; 2 ♂♂ (19.vi.1980), Kassam Pass, R.A.I. Drew and D.W. Currey. All paratypes attracted to methyl eugenol.

LOCATION OF TYPES: Holotype (T.10517) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 10 paratypes in DPI.

DISTRIBUTION

Known only from Morobe Province, Papua New Guinea.

DIAGNOSIS

Small to medium sized species; medium sized subquadrate black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles, scutellum yellow; legs fulvous except fore tibiae fuscous and hind tibiae dark fuscous; wing with a broad fuscous costal band (reaching almost to R_{4+5}) and broad fuscous anal streak, costal cells very pale fulvous with microtrichia absent or covering most of second costal cell; abdominal terga III–V dark orange-brown except for a narrow transverse dark fuscous band across anterior margin of tergum III, a narrow medial longitudinal dark fuscous band and 2 narrow lateral longitudinal bands which are dark fuscous on tergum III and fuscous on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.05 mm. Frons narrowing slightly posteriorly, length 1.42 times breadth; fulvous with, at most, pale fuscous around orbital bristles; anteromedial hump covered by short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized subquadrate black spots; length of face 0.38 mm. Genae fulvous, pale fuscous subocular spot present; red-brown bristle present. Occiput fuscous, yellow along eye margins; occipital row with 4–8 bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.14 mm; 0.23 mm; 0.60 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae and dark fuscous between humeral and notopleural calli. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder including ventral margins black); 2 lateral postsutural vittae

narrowing posteriorly to end just before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous except fore tibiae fuscous and hind tibiae dark fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.8 mm; costal cells very pale fulvous; microtrichia covering most of second costal cell (in some specimens microtrichia are sparse); remainder of wings colourless or with a very pale fuscous tint, except fuscous subcostal cell, broad fuscous costal band almost reaching R_{4+5} and crossing this vein at its apex, broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II dark orange-brown except for a transverse dark fuscous band across anterior $\frac{1}{2}$ which expands over lateral margins; terga III–V dark orange-brown except for a narrow transverse dark fuscous band across anterior margin of tergum III, a narrow medial longitudinal fuscous band which ends in centre of tergum V, 2 narrow lateral longitudinal bands which are dark fuscous on tergum III and fuscous on terga IV and V. A pair of oval pale fuscous shining spots on tergum V. (There are some variations in the abdominal colour patterns, i.e. the lateral and longitudinal bands are sometimes reduced in size and intensity of colour.) Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. mimulus is similar to *B. aemula* (*aemula* complex) in possessing costal band overlapping R_{2+3} , no tint of fuscous colouration across wing membrane, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, costal cells with a pale fulvous tint and lateral postsutural vittae ending before upper pa. bristles. It differs from this species in having abdominal terga III–V dark orange-brown with narrow medial and longitudinal dark bands joined along anterior margin of tergum III and costal band almost confluent with R_{4+5} .

Bactrocera (Bactrocera) nigrescens (Drew), n. comb. (Fig. 102)

Asiadacus nigrescens Drew, 1968a: 23–4.

Dacus (Strumeta) nigrescens: Drew, 1972a: 21.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6576) in QM.

DISTRIBUTION

Occurs in large numbers in New Britain (type locality), New Ireland, Lihir and Bougainville Is.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe slightly broader than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown with black laterally on terga III and IV, fuscous on tergum V and a medial longitudinal black band over all 3 terga.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. nigrescens was described adequately by Drew (1968a). It is similar to *B. trivialis* (Drew) (*aemula* complex) in possessing an entirely black mesonotum, costal cells colourless and lateral postsutural vittae ending at or behind upper pa. bristles. It differs from this species in having prsc. bristles absent, abdominal terga III–V orange-brown with a broad medial longitudinal black band over all 3 terga and moderately broad black margins on tergum III.

Bactrocera (Bactrocera) opilliae (Drew and Hardy), n. comb. (Figs 103–105)

Dacus (Bactrocera) opilliae Drew and Hardy, 1981: 131–7.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8427) in QM.

DISTRIBUTION

Widespread throughout the northern regions of the Northern Territory (type locality, Darwin) and Western Australia. It is most prevalent in the coastal regions and Melville I. but expands further inland during the wet season.

DIAGNOSIS

Medium sized species; medium sized circular black facial spots present; humeral and notopleural calli yellow; mesonotum either uniformly dull black or red-brown with an irregular pattern of longitudinal dull black bands, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs mostly fulvous except fore tibiae very pale fuscous and hind tibiae pale fuscous to fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown and generally with a dark fuscous to black transverse band across anterior margin of tergum III, expanding to cover lateral margins and a medial longitudinal dark fuscous to black band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.52 times breadth; fulvous with, at most, pale fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized circular black spots; length of face 0.43 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 5–7 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.25 mm; 0.75 mm.

Thorax mesonotum either uniformly dull black or red-brown with a pattern of longitudinal dull black markings. Pleural areas red-brown except dull black on sternopleuron and along anterior and posterior margins of mesopleural stripe. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae ending behind upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2;

pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except fore tibiae very pale fuscous and hind tibiae pale fuscous to fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.5 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band only slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I orange-brown; tergum II orange-brown tending fulvous along posterior margin each side of centre line and with transverse fuscous lines across centre of tergum; terga III–V orange-brown and generally with a dark fuscous to black transverse band across anterior margin of tergum III expanding to cover lateral margins, a medial longitudinal dark fuscous to black band over all 3 terga and ending before posterior margin of tergum V. The area and intensity of dark colour on terga III–V often varies and is sometimes reduced to pale fuscous along anterior margin of tergum III and fuscous to dark fuscous on the medial longitudinal band. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of ovicape to length of tergum V 0.68:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (Fig. 104). Spicules at distal end of middle segment of medium width with a row of 8–10 thin dentations of approximately equal size (Fig. 105).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. opiliae (Drew and Hardy) is similar to *B. cacuminata* (Hering) (*dorsalis* complex) in having the mesonotum red-brown with a distinct black pattern (not entirely black), mesopleural stripe reaching midway between anterior margin of

notopleural callus and anterior npl. bristle, costal cells colourless and lateral postsutural vittae ending at or behind upper pa. bristles. It differs from this species in having the costal band overlapping R_{2+3} and the black pattern on the mesonotum not distinctly lanceolate as in *B. cacuminata*.

fagraea complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for narrow costal band (not confluent with R_{4+5}) and anal streak, costal cells without dense microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad dark basal band $\frac{1}{4}$ to $\frac{1}{2}$ width of scutellum, mesonotum generally red-brown with or without dark markings, males of some species attracted to cue lure.

***Bactrocera (Bactrocera) fagraea* (Tryon), n. comb. (Figs 106–108)**

Chaetodacus fagraea Tryon, 1927: 188–90.

Dacus (Strumeta) fagraeus: Hardy, 1951: 154–5.

Strumeta fagraea: May, 1963: 45, 50.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: Lectotype ♂ (D.3122) and paralectotype ♀ (D.3122) in QM.

DISTRIBUTION

Known only from rainforests in north-east Queensland, north from Ayr (type locality, Babinda), common on the Atherton Tableland.

DIAGNOSIS

Medium sized species; medium sized subquadrate black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae narrow and ending before upper pa. bristles, scutellum yellow with a very broad red-brown basal band; legs fulvous except hind tibiae pale fuscous; wing with a narrow pale fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga I–V orange-brown except tending fulvous posterolaterally on tergum II, a narrow very pale fuscous medial longitudinal stripe on tergum V and posterior $\frac{1}{2}$ of tergum IV.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.57 times breadth; fulvous with, at most, pale fuscous around s.or. bristles and on anteromedial hump; latter covered by a large number of short dark setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle dark fuscous. Vertex fulvous. Face fulvous with medium sized subquadrate black spots; length of face 0.45 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–5 red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 narrow lateral postsutural vittae tapering slightly posteriorly to end before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for broad red-brown basal band equal in width to $\frac{1}{3}$ the depth of the scutellum. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles generally well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 6.0 mm; costal cells fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, pale fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V orange-brown except tending fulvous along posterior margin of tergum II each side of medial line, a narrow very pale fuscous medial longitudinal line on tergum V and posterior of tergum IV. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus

short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view; ratio of length of ov scape to length of tergum V 1.22:1. Apex of piercer needle shaped with 4 pairs of small subapical bristles (Fig. 107). Spicules at distal end of middle segment of medium width with 9–13 dentations of uneven size, with the largest of medium length (Fig. 108).

ATTRACTANT: Cue lure, Willison's lure (probably a weak attraction to these lures because of low numbers taken in traps).

COMMENTS

B. fagraea is similar to *B. halfordiae* (Tryon), *B. kraussi* (Hardy), *B. rufescens* (May), *B. russeola* (Drew and Hancock) (*fagraea* complex) in having the mesonotum mostly red-brown, scutellum with a broad basal dark band ($\frac{1}{4}$ to $\frac{1}{2}$ width of scutellum), costal cells with microtrichia in outer portion of second costal cell only, wing not infuscated except for costal band and anal streak, lateral postsutural vittae present and medial postsutural vitta absent. It differs from all these species in having abdominal tergum V without dark shining spots and dark basal band on scutellum approximately $\frac{1}{3}$ length of scutellum.

Originally, Tryon (1927) designated 2 types now in QM. One severely damaged female (head, abdomen and 1 wing missing) has 3 labels: "TYPE D/3122", "Babinda, Q. 26.6.25, R.W.M.", "Edmund Jarvis, Coll. Ex.". The other, a male has 3 labels: "ALLOTYPE D/3122", "Babinda, Q., 24.6.25, R.W.M.", "Edmund Jarvis, Coll. Ex.". It is doubtful that the type labels were placed on the specimens by Tryon as they are of the style used by QM. Therefore some uncertainty exists as to whether or not Tryon designated a holotype. Consequently, I designate the male labelled allotype as lectotype and the other as paralectotype.

Bactrocera (Bactrocera) halfordiae (Tryon), n. comb. (Figs 109–111)

Chaetodacus halfordiae Tryon, 1927: 190–1.

Chaetodacus gurneyi Perkins, 1934: 41–2; May, 1953: 52 (syn.).

Dacus (Strumeta) halfordiae: Hardy, 1951: 155–6.

Strumeta halfordiae: May, 1963: 45–6, 50.

Dacus (Bactrocera) halfordiae: Drew, 1982: 29–31.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); Tryon's and Perkins' type specimens; large series of specimens (in NSW) labelled Narara, New South Wales, bred from White Ash berries and Cheesewood berries, 4.2.1910 and 1910 respectively.

LOCATION OF TYPES: *C. halfordiae*, lectotype ♀ (D.3123) and paralectotype ♂ (D.3123) in QM; *C. gurneyi*, 52 ♂ ♀ syntypes in UQ, 1 ♂ syntype in NSW.

DISTRIBUTION

The endemic distribution of *B. halfordiae* is from south-east Queensland (approximately 26° S) where it occurs mostly at higher altitudes (type locality, Southport), to the Sydney area of New South Wales. It does not occur further north where *B. kraussi* (Hardy), a closely related species, occupies hosts in the same genera. *B. halfordiae* is unique in having a subtropical to temperate distribution. There are 2 specimens in the Macleay Collection, University of Sydney, collected in the Sydney area between 1830 and 1850.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum pale red-brown with irregular dark markings, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad red-brown basal band extending to centre; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga generally orange-brown with fuscous on lateral margins of all terga and the shining oval spots on tergum V dark brown to fuscous.

DESCRIPTION

FEMALE: Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of ov scape to length of tergum V 0.76:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 110). Spicules at distal end of middle segment of medium width with 8–11 small dentations (Fig. 111).

ATTRACTANT: No known record.

COMMENTS

B. halfordiae was described adequately by Drew (1982). It is similar to all other species in the *fagraea* complex in the characters listed in the comments on *B. fagraea* (Tryon). It differs from *B. rufescens* (May) in lacking a medial dark band

on the abdominal terga, from *B. fagraea* (Tryon) and *B. russeola* (Drew and Hancock) in having lateral dark markings on abdominal terga III and IV and *B. kraussi* (Hardy) in having the mesonotum and abdominal terga uniformly red-brown, fuscous lateral margins on abdominal terga III and IV narrow, mesopleural stripe not wider than notopleural callus and lateral postsutural vittae narrow and narrowing sharply posteriorly.

B. halfordiae appears to be of no economic importance, no commercial host records having been obtained since May (1953). The commercial host records of *B. halfordiae* may be incorrect as early workers confused the identity of this species with *B. tryoni*.

Originally, Tryon (1927) designated types as follows: "Type.—Regis. No. D.3123, male and female". On the female specimen there is a white card with "TYPE D/3123" and on the male specimen a white card with "ALLOTYPE D/3123". For the same reason given in the comments on *B. fagraea*, I designate the specimen labelled type as lectotype and the other specimen as paralectotype.

Bactrocera (Bactrocera) kraussi
(Hardy), n. comb. (Figs 112–114)

Dacus (Strumeta) kraussi Hardy, 1951: 156–9.

Strumeta kraussi: May, 1953: 56–8; May, 1957a: 34; May, 1960: 197; May, 1963: 46–7, 50.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).
LOCATION OF TYPE: Holotype ♂ in NMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Rainforests along the eastern coast of north Queensland (type locality, Deeral).

NEW RECORD: Torres Strait islands: Moa (Banks) (record from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized oval facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with irregularly shaped lateral longitudinal pale fuscous to fuscous bands, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad red-brown to fuscous basal band; wing colourless or with a pale fulvous tint and a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fulvous to fulvous with microtrichia in outer corner of second costal cell

only; abdominal terga III and IV fuscous and tergum V fulvous except for broad lateral dark fuscous margins on terga III and IV and broad fuscous lateral margins on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.6 times breadth; fulvous with, at most, pale fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short dark setae; orbital bristles red-brown: 1 s.or., 2 s.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized oval black spots; length of face 0.45 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput red-brown, yellow along eye margins; occipital row with 3–7 well developed bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.73 mm.

Thorax mesonotum red-brown with broad lateral longitudinal pale fuscous to fuscous bands. Pleural areas fuscous, tending red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices fuscous); anterior 3/5 lower hypopleural calli (remainder fuscous); 2 lateral postsutural vittae narrowing slightly posteriorly to end at or before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for broad fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all coxae fuscous; femora fulvous except fore and mid femora tending red-brown apically and hind femora tending red-brown to pale fuscous apically; remaining segments fulvous except hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells pale fulvous to fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless or with a pale fuscous tint except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin;

dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous; tergum II fulvous except for a broad transverse fuscous band along anterior margin and widening to cover lateral margins; terga III and IV fuscous and tergum V fulvous except for irregularly shaped broad lateral longitudinal bands which are dark fuscous on terga III and IV and fuscous on tergum V. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.15:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 113). Spicules at distal end of middle segment wide with 9 or 10 dentations, usually 2 or 3 elongate and wide and the remainder small (Fig. 114).

HOST PLANTS

NEW RECORDS: *Syzygium rubrimolle* (Myrtaceae), Lake Boronto, near Somerset, Bamaga (Cape York, Queensland), December 1974, D.J. Rogers (in 1 sample associated with *B. jarvisi* (Tryon) and *B. tryoni* (Froggatt) and in another with *B. jarvisi*); *Syzygium* sp. (Myrtaceae), on Somerset road (27 km from Bamaga), Cape York, Queensland, December 1974, D.J. Rogers. *Notolaea* sp. (Oleaceae), Lake Boronto, Lockerbie, near Somerset (Cape York, Queensland), December 1974, D.J. Rogers (mostly heavily infested and in 1 sample associated with *B. jarvisi* and *B. neohumeralis* (Hardy)). *B. kraussi* is closely related to *B. halfordiae* (Tryon) and occupies the host niche in North Queensland that *B. halfordiae* occupies in south-east Queensland.

ATTRACTANT: Cue lure.

COMMENTS

B. kraussi is similar to all other species in the *fagraea* complex in the characters listed in the comments on *B. fagraea* (Tryon). It differs from *B. rufescens* (May) in lacking a medial dark band on abdomen, from *B. fagraea* and *B. russeola* (Drew and Hancock) in having lateral fuscous markings on abdominal terga III and IV and from

B. halfordiae (Tryon) in having a red-brown mesonotum with or without fuscous markings, abdomen usually fuscous over terga III and IV and laterally on tergum V, mesopleural stripe $1\frac{1}{2}$ times the width of notopleural callus and lateral postsutural vittae parallel sided.

Bactrocera (Bactrocera) rufescens (May), n. comb. (Fig. 115)

Strumeta rufescens May, 1967 : 81-2.

MATERIAL EXAMINED

Holotype ♂ and 1 ♂ paratype, Kuranda, north Queensland, 16.vi.1964, R. Grattidge.

LOCATION OF TYPES: Holotype (T.6545) in QM; paratype in DPI.

DISTRIBUTION

Kuranda, north Queensland (type locality).

DIAGNOSIS

Small to medium sized species; medium sized pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe equal in width to notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad red-brown basal band equal in width to $\frac{1}{3}$ the length of the scutellum; legs fulvous with hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown with a medial longitudinal dark fuscous band and 2 broad lateral longitudinal dark fuscous bands over all 3 terga and joined along anterior margin of tergum III by a paler fuscous area.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.55 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.38 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 5 weak pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.28 mm; 0.63 mm.

Thorax mesonotum red-brown without dark markings. Pleural areas pale fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; narrow mesopleural stripe, equal in width to notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $3/5$ lower hypopleural calli (remainder including broad ventral margins red-brown); 2 narrow lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for broad red-brown basal band equal in width to at least $1/3$ the length of the scutellum. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical fuscous spur.

Wings length 5.3 mm, costal cells fulvous; microtrichia in outer corner of second costal cell only; remainder of wings with a pale fuscous tint except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I red-brown; tergum II red-brown tending fulvous along posterior margin either side of midline; terga III–V orange-brown except for a medial longitudinal dark fuscous band and 2 broad lateral longitudinal dark fuscous bands over all 3 terga and joined by a pale fuscous area along anterior margin of tergum III. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. rufescens is similar to all other species in the *fagraea* complex in the characters listed in the comments on *B. fagraea* (Tryon). It differs from these species in having a well defined medial black vitta on terga III–V.

Bactrocera (Bactrocera) russeola

(Drew and Hancock), n. comb. (Fig. 116)

Dacus (Bactrocera) russeolus Drew and Hancock, 1981: 80–1.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.8303) in QM.

DISTRIBUTION

Paluma (type locality), The Crater, Wallaman Falls and Maiden Hair Fern Gully (Mt Spec). This species is known only from high altitudes in north Queensland.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with or without fuscous markings, mesopleural stripe equal in width to notopleural callus, lateral postsutural vittae present; medial postsutural vitta absent, scutellum yellow with a broad red-brown basal band reaching to centre; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous, microtrichia in outer corner of second costal cell only; abdominal terga uniformly red-brown with oval shining spots on tergum V dark fuscous to black.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. russeola was described adequately by Drew and Hancock (1981). It is similar to all other species in the *fagraea* complex in the characters listed in the comments on *B. fagraea* (Tryon). It differs from *B. rufescens* (May) in lacking a medial black band on the abdomen, from *B. halfordiae* (Tryon) and *B. kraussi* (Hardy) in having abdominal terga III–V uniformly pale coloured without dark markings and from *B. fagraea* in having a pair of dark shining spots on abdominal tergum V, mesonotum red-brown and dark basal band on scutellum about $1/2$ length of the scutellum.

frauenfeldi complex

DEFINITION OF COMPLEX: *Bactrocera* species with wing with a narrow transverse fuscous band enclosing both crossveins and almost no costal band infuscation apical to this cross band, costal cells coloured, medial postsutural vitta absent, scutellum yellow with a triangular black marking on dorsal surface sometimes reduced to a broad basal band, mesonotum shining black, abdominal terga either entirely shining black or with orange-brown bordering a medial longitudinal shining black band on terga III–V, males attracted to cue lure.

***Bactrocera (Bactrocera) caledoniensis*, n. sp.**
(Fig. 117)

TYPE SPECIMENS

Holotype ♂, NEW CALEDONIA: Sarramea, attracted to cue lure, 6–9.i.1970, P. Cochereau.

Paratype, NEW CALEDONIA: 1 ♂, Sarramea, attracted to cue lure, 6–9.i.1970, P. Cochereau.

LOCATION OF TYPES: Holotype (T.10518) in QM; paratype in DPI.

DISTRIBUTION

Known only from New Caledonia.

DIAGNOSIS

Small to medium sized species; facial spots absent; humeral calli yellow (anterodorsal corners black); notopleural calli yellow; mesonotum shining black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles, medial postsutural vitta absent, scutellum yellow with a broad triangular basal band; legs fulvous except hind tibiae very pale fuscous; wing with a narrow very pale fuscous costal band and broad fuscous anal streak, a narrow fuscous transverse band across wing and enclosing both crossveins, costal cells very pale fulvous with microtrichia in outer corner of second costal cell only; all abdominal terga shining black except for a narrow dark fuscous transverse band across posterior margin of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons narrowing slightly posteriorly, length 1.76 times breadth; fulvous without dark markings, anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark markings: length of face 0.43 mm. Genae fulvous, large brown subocular spot present; black bristle present. Occiput black, fulvous along eye margins; occipital row with 3–7 strong black bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong dark fulvous dorsal bristle on segment 2; length of segments: 0.13 mm; 0.25 mm.

Thorax mesonotum shining black without pale markings. Pleural areas shining black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli (except anterodorsal margin shining black); notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly

convex; upper hypopleural calli (posterior apices shining black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width, narrowing slightly posteriorly to end before upper pa. bristles. Postnotum shining black. Scutellum yellow except for a broad triangular basal band equal in width to about 1/3 the length of the scutellum. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous except hind tibiae very pale fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.4 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow very pale fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a narrow transverse fuscous band across wing and enclosing both crossveins, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All abdominal terga shining black except for a narrow transverse dark fuscous band across posterior margin of tergum V. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. caledoniensis is similar to *B. frauenfeldi* (Schiner), *B. parafrasfeldi* and *B. trilineola*, n. nom. for *B. triseriata* (Drew) not Curran (see later in this complex), in having a black mesonotum, narrow transverse fuscous band across wing and enclosing both crossveins, almost no costal band infuscation apical to cross band, costal cells coloured, medial postsutural vitta absent and scutellum with a triangular black marking on dorsal surface. It differs from these species in having humeral calli mostly yellow and the black basal band on the scutellum about 1/3 the length of the scutellum.

Bactrocera (Bactrocera) frauenfeldi
(Schiner), n. comb. (Figs 118–120)

Dacus frauenfeldi Schiner, 1868: 262; Froggatt, 1909: 96; Malloch, 1939a: 232–3.

Strumeta frauenfeldi: Perkins, 1938: 128–9.

Dacus (Strumeta) frauenfeldi: Hardy and Adachi, 1954: 168–9; Hardy, 1968: 138 (lectotype designation); Drew, 1974a: 41–5.

Dacus (Bactrocera) frauenfeldi: Drew, 1982: 27–9.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION). LOCATION OF TYPE: Lectotype ♀ and paralectotype ♀ in NHMV (Hardy, 1968). There is 1 ♀ paralectotype in BMNH labelled "Paratype", "Navara-R, Linard Insel", "Frauenfeldi, Alte Sammlung", "Type". (Navara-R = Novara Reise (Voyage of the Novara); Linard Insel = Linard Island; Alte Sammlung = Old Collection. The latter label is in the style of the Vienna Museum.

DISTRIBUTION

PREVIOUSLY RECORDED: Large populations from Cape York (Queensland) to Papua New Guinea, islands of the Bismarck Archipelago, Bougainville I., Solomon Islands and Stuart I. (type locality). NEW RECORDS: Torres Strait islands: Badu, Boigu, Darnley, Dauan, Hammond, Horn, Moa (Banks), Murray, Prince of Wales, Saibai, Stephens, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral calli black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a black triangle on dorsal surface; wing with a narrow extremely pale fuscous costal band and broad fuscous anal streak, a narrow fuscous transverse band across wing, costal cells pale fuscous, microtrichia covering most of second costal cell; abdominal terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal black bands.

DESCRIPTION

FEMALE: Ovipositor basal segment dark red-brown to fuscous, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.69:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 119). Spicules at distal end of middle segment of medium width with 8–12 dentations of uneven size with the largest of medium length (Fig. 120).

HOST PLANTS

NEW RECORDS: *Manilkara kauki* (Sapotaceae), Sue I. 1980, G. Sanewski; *Syzygium branderhorstii*

(Myrtaceae), Darnley I. 1980, G. Sanewski; *Terminalia catappa* (Combretaceae) in Torres Strait islands. It was observed ovipositing in ripe papaya on Murray I. May 1986, J. Turner. This species could become a serious pest when horticultural industries are developed within its geographic range.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. frauenfeldi was described adequately by Drew (1974a). It is similar to *B. parafrasienfeldi* and *B. trilineola* in having black humeral calli and a black triangular marking on dorsal surface of scutellum extending to the apex but differs in possessing lateral postsutural vittae and with the black markings on the scutellum generally with a distinct triangular shape reaching the apex as a point.

B. albistrigata (de Meijere), regarded as a synonym of *B. frauenfeldi* by Hardy and Adachi (1954), is a distinct species. It possesses yellow humeral calli and is confined to South East Asia.

Bactrocera (Bactrocera) parafrasienfeldi, n. sp. (Fig. 121)

TYPE SPECIMENS

Holotype ♂, AUSTRALIA, Northern Territory: Smith Point, Cobourge Peninsula, attracted to cue lure, 31.i.1982, R.A.I. Drew and A.J. Allwood.

Paratypes, AUSTRALIA, Northern Territory: 1 ♂ (28.i.1982) and 1 ♂ (31.i.1982), Smith Point, Cobourge Peninsula, attracted to cue lure, R.A.I. Drew and A.J. Allwood; 2 ♂♂ (19.iv.1977), Smith Point, Cobourge Peninsula, attracted to cue lure, A.J. Allwood; 1 ♂ (8.xii.1975), Melville I., attracted to Willison's lure, A.J. Allwood.

LOCATION OF TYPES: Holotype (T.10519) in QM; 1 paratype in ANIC; 4 paratypes in DPI.

DISTRIBUTION

Known from Cobourge Peninsula and Melville I. (Northern Territory), Australia.

DIAGNOSIS

Dark coloured medium sized species; medium sized oval black facial spots present; humeral calli glossy black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae absent or present as a very short narrow tawny coloured spot, scutellum yellow with a very broad medial glossy black band; legs fulvous except apical $\frac{2}{3}$ – $\frac{3}{4}$ of fore femora and apical $\frac{1}{3}$ of hind femora glossy black, fore and mid tibiae fuscous and hind tibiae dark fuscous; wing with a distinct costal band absent and a narrow transverse fuscous band

across centre which encloses both crossveins, costal cells pale fuscous, microtrichia covering most of second costal cell only; abdominal terga II–V orange-brown except for a broad medial and 2 broad lateral longitudinal glossy black bands.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.89 times breadth; fulvous with dark fuscous around orbital bristles and on anteromedial hump; latter covered with a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fuscous. Ocellar triangle black. Vertex dark fuscous. Face fulvous with medium sized oval black spots not reaching epistoma; length of face 0.43 mm. Genae fulvous, dark fuscous subocular spot present; black bristle present. Occiput black, yellow along eye margins; occipital row with 5–8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.80 mm.

Thorax mesonotum and pleural areas glossy black with no brown markings. Yellow markings as follows: notopleural calli; mesopleural stripe of medium width, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a very small spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli (remainder, including ventral margin, black). Lateral postsutural vittae absent or, if present; they are very short, narrow, tawny coloured spots ending well before sa. bristles. Humeral calli glossy black. Postnotum glossy black. Scutellum yellow except for a broad medial glossy black band which encloses the apical bristles. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae dark fuscous, mid and hind coxae black; fore femora fulvous, mid femora with apical $\frac{2}{3}$ – $\frac{1}{4}$ black (remainder fulvous), hind femora with apical $\frac{1}{3}$ black (remainder fulvous), fore tibiae fuscous, mid tibiae fuscous tending paler apically, hind tibiae dark fuscous; tarsi fulvous except apical 4 segments of fore tarsi and apical 3 segments of hind tarsi fuscous; mid tibiae each with an apical black spur; rows of long dark setae on dorsal surfaces of fore femora.

Wings length 5.1 mm; costal cells pale fuscous; microtrichia covering most of second costal cell only; remainder of wings colourless except fuscous subcostal cell, a narrow transverse fuscous band

across wing enclosing both crossveins, a broad fuscous anal streak ending at wing margin (the costal band is absent except for a very pale tint along costal margin in some specimens); dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I glossy black; terga II–V orange-brown except for 2 broad lateral and a broad medial longitudinal glossy black bands extending over all terga. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. parafrauenfeldi is similar to *B. trilineola* in having lateral postsutural vittae absent and with the black marking on the scutellum as a broad black band enveloping both apical bristles but differs in possessing medium sized oval black facial spots, costal cells darker (pale fuscous), microtrichia covering most of second costal cell, costal band entirely absent beyond subcostal cell, femora fulvous with apical $\frac{2}{3}$ – $\frac{1}{4}$ of mid femora and apical $\frac{1}{2}$ of hind femora black, fore and mid tibiae fuscous and hind tibiae dark fuscous.

Bactrocera (Bactrocera) trilineola n. nom. (Figs 122–124)

Not *Dacus triseriatus* Curran, 1927: 87.

Dacus (Strumeta) triseriatus Drew, 1971: 90–2.

MATERIAL EXAMINED

A large series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6964) in QM.

DISTRIBUTION

Known from the following islands in Vanuatu (formerly New Hebrides): Efate (type locality, Vila), Malekula and Espiritu Santo.

DIAGNOSIS

Medium sized species; face entirely glossy black; humeral calli fuscous to black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum glossy black with lateral margins yellow; wing with a narrow extremely pale fuscous costal vein and broad fuscous anal streak, a narrow fuscous transverse band across wing, costal cells

extremely pale fuscous, microtrichia covering outer $\frac{1}{2}$ of second costal cell only; abdominal terga mostly glossy black except for 2 broad longitudinal fulvous bands on terga II–V either side of a broad medial longitudinal glossy black band.

DESCRIPTION

FEMALE: Ovipositor basal segment fuscous, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.1:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 123). Spicules at distal end of middle segment of medium width with 5–10 dentations of uneven size (Fig. 124).

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. trilineola was described adequately by Drew (1971). It is similar to all other species in the *frauenfeldi* complex in the characters listed in the comments on *B. caledoniensis*. It differs from *B. caledoniensis* and *B. frauenfeldi* (Schiner) in possessing a glossy black face and in lacking lateral postsutural vittae and from *B. parafrasienfeldi* in having a glossy black face, costal cells extremely pale fuscous, microtrichia in outer $\frac{1}{2}$ of second costal cell only, costal band present but very pale beyond subcostal cell and legs fulvous except apical $\frac{1}{3}$ of hind femora and hind tibiae fuscous. The apex of piercer and the spicules on the middle segment of the ovipositor are similar in *B. frauenfeldi* and *B. trilineola*, however the apex of piercer is slightly more pointed in *B. trilineola*.

fulvicauda complex

DEFINITION OF COMPLEX: *Bactrocera* species with infuscation on wing as a transverse band across centre region in addition to costal band and anal streak, lateral postsutural vittae present, medial postsutural vitta absent, scutellum entirely yellow; males of some species attracted to methyl eugenol.

Bactrocera (Bactrocera) fulvicauda (Perkins), n. comb. (Figs 125–127)

Strumeta fulvicauda Perkins 1939: 13–15.

Dacus (Strumeta) fulvicaudus: Drew, 1974a: 47–50.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♀ (T.11137) in QM.

DISTRIBUTION

Widespread throughout the lowland rainforests

of Papua New Guinea (type locality, Mt Lamington).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a broad transverse fuscous band across wing, costal cells fulvous, microtrichia covering most of second costal cell and outer corner of first costal cell; abdominal terga III–V vary from mostly black to red-brown with broad medial and lateral longitudinal black bands (Figs 125A, B).

DESCRIPTION

FEMALE: Ovipositor basal segment red-brown, elliptical in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 2.17:1. Apex of piercer wide narrowing sharply to a point with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 126). Spicules at distal end of middle segment of medium width with 1 or 2 very long, broad dentations and 1–4 small lateral dentations (Fig. 127).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. fulvicauda was described adequately by Drew (1974a). It is similar to *B. pulchra* (Tryon) and *B. unistriata* (Drew) (*fulvicauda* complex) in possessing humeral and notopleural calli yellow, not joined by a lateral yellow band and a transverse band across wing broad covering outer $\frac{1}{3}$ – $\frac{1}{2}$ of discoidal cell, but differs in having the mesopleural stripe broad and extending to the humeral callus.

Bactrocera (Bactrocera) latilineata, n. sp. (Fig. 128)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western Highlands Province: Mt Hagen, attracted to methyl eugenol, 13.i.1980, B. Thistleton.

Paratype, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Mt Missim (1550 m), attracted to cue lure, 19.iii.1981, A. Allison.

LOCATION OF TYPES: Holotype (T.10520) in QM; paratype in DPI.

DISTRIBUTION

Known from Mt Hagen and Mt Missim, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots small and pear shaped; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe narrow (just slightly wider than notopleural callus), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, a broad transverse fuscous band across wing which encloses both crossveins, first costal cell fulvous, second costal cell pale fulvous, microtrichia covering second costal cell; abdominal terga III–V red-brown except for a broad medial and 2 broad lateral longitudinal dark bands which join along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.5 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small pear shaped black spots; length of face 0.48 mm. Genae fulvous, brown sub-ocular spot present; red-brown bristle present. Occiput fuscous, fulvous along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong red-brown dorsal bristle on segment 2; length of segments: 0.15 mm; 0.30 mm.

Thorax mesonotum black except dark brown below and behind lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; narrow mesopleural stripe, slightly wider than notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli (remainder black); 2 narrow parallel sided lateral postsutural vittae ending at upper pa. bristles. Postnotum black. Scutellum yellow except for a narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except fore tibiae pale fuscous, hind tibiae dark fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.1 mm; first costal cell fulvous, second costal cell pale fulvous; microtrichia along anterior margin of first costal cell and covering second costal cell except posterior margin;

remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad transverse fuscous band across wing which encloses both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse orange-brown band across posterior margin but not reaching lateral margins; tergum II orange-brown except for a broad transverse black band across anterior margin which changes to dark fuscous as it widens to cover lateral margins; terga III–V red-brown except for 2 broad lateral longitudinal dark fuscous bands which join along anterior margin of tergum III, a moderately broad medial longitudinal band which is dark fuscous on tergum III and black on terga IV and V. A pair of oval red-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Uncertain.

COMMENTS

B. latilineata is similar to *B. furvilineata* and *B. rhabdota* (*distincta* complex) in possessing yellow humeral and notopleural calli not joined by a lateral yellow band, mesopleural stripe not extending to humeral callus, transverse band across wing narrow (covering less than $\frac{1}{3}$ of discoidal cell), lateral postsutural vittae ending at upper pa. bristles and costal band overlapping R_{2+3} but not confluent with R_{4+5} . It differs from *B. furvilineata* in having fulvous costal cells and a wider transverse band across wing and from *B. rhabdota* in having abdominal terga III–V red-brown except for 2 broad lateral longitudinal dark fuscous bands, a broad medial longitudinal band which is dark fuscous to black on terga IV and V and connected to the lateral bands across anterior margin of tergum III.

***Bactrocera* (*Bactrocera*) *pulchra* Tryon**
(Fig. 129)

Bactrocera pulcher Tryon, 1927: 206–7.

Dacus (*Strumeta*) *pulcher*: Hardy, 1951: 165–7.

Strumeta pulcher: May, 1963: 50.

MATERIAL EXAMINED

Holotype ♂, Glasshouse Mts, south-east Queensland; 1 ♂, Atherton Tableland, north Queensland, ex *Planchonella* sp., September 1949, N.L.H. Krauss (on loan from UH). LOCATION OF TYPE: Holotype (D.5163) in QM.

DISTRIBUTION

Known from the Glasshouse Mountains (type locality), south-east Queensland (Tryon, 1927) and Atherton Tableland, north Queensland (Hardy, 1951).

DIAGNOSIS

Medium sized species; large pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe just wider than notopleural callus, lateral postsutural vittae narrow and short, medial postsutural vitta absent, scutellum yellow with a broad black basal band; legs entirely fulvous; wing with a broad fuscous costal band and anal streak, a broad transverse fuscous band across centre of wing, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III and IV black, tergum V fulvous with anterolateral corners dark fuscous, a narrow black transverse band across anterior margin and extending into a narrow short medial longitudinal black band.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.9 mm. Frons narrowing slightly posteriorly, length 1.43 times breadth; fulvous with pale fuscous around orbital bristles; anteromedial hump covered by a large number of short pale setae; orbital bristles fuscous: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with large pear shaped black spots; length of face 0.55 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput black, fulvous along eye margins; occipital row with 6–7 strong dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.45 mm; 0.93 mm.

Thorax mesonotum dull black except brown markings as follows: below and behind lateral postsutural vittae, inside lateral postsutural vittae, around mesonotal sutures, between humeral and notopleural calli. Pleural areas black, tending pale below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; narrow mesopleural stripe, slightly wider than notopleural callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{1}{2}$ lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing posteriorly to end well before upper pa. bristles. Postnotum black. Scutellum yellow except for broad black basal band. Bristles: sc. 2; prsc. 2; pa.

2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous; mid tibiae each with an apical black spur.

Wings length 6.8 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and overlapping this vein at apex of wing, broad fuscous transverse band across centre of wing and enclosing both crossveins, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; super-numerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II fulvous except for a broad transverse black band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III and IV black; tergum V fulvous except anterolateral corners dark fuscous, a narrow transverse black band across anterior margin and developing into a small narrow medial longitudinal black band. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. pulchra is similar to *B. unistriata* (Drew) in having yellow humeral and notopleural calli not joined by a lateral yellow band, mesopleural stripe not extending to humeral callus and transverse band across wing broad (covering at least outer $\frac{1}{3}$ of discoidal cell). It differs from this species in having the mesopleural stripe narrow (equal in width to notopleural callus), lateral postsutural vittae narrow and ending before upper pa. bristles, costal cells fuscous and covered with a dense mass of microtrichia.

Originally, Tryon (1927) listed a single specimen (Reg. No. D. 1084) as the type. In QM there is 1 male with 2 white labels marked "D. 1084" and "D/5163", this is the holotype.

May (1953) stated that specimens of this species "have been trapped in the Nambour–Palmwoods area, close to the type locality, but no hosts have been located in southern Queensland." Intensive male lure and bacterial bait trapping in recent years (Drew, unpub. data) in the type locality has failed to capture this species. If it still exists in south-east Queensland its population must be extremely small. Tryon incorrectly used the masculine form *pulcher* with *Bactrocera*. The correct feminine form is *pulchra*.

Bactrocera (Bactrocera) unistriata
(Drew), n. comb. (Fig. 130)

Dacus (Strumeta) unistriatus Drew, 1971: 96–8.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6969) in QM.

DISTRIBUTION

Widely distributed throughout New Britain (type locality, Keravat), New Ireland and Lihir I.

DIAGNOSIS

Large species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a transverse fuscous band across wing which is narrow along r–m crossvein and widening over posterior ½ of wing, costal cells pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga II–V generally fulvous with a narrow medial longitudinal fuscous band running over all 4 terga and 2 broad lateral longitudinal dark fuscous bands over terga III–V.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. unistriata was described adequately by Drew (1971). It is similar to *B. pulchra* (Tryon) in the characters listed in the comments on this species but differs in having a broader mesopleural stripe (ending midway between anterior margin of notopleural callus and anterior npl. bristle), lateral postsutural vittae broad and ending at upper pa. bristles, costal cells pale fulvous with microtrichia in outer portion of second costal cell only.

***furfurosa* complex**

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for a broad costal band (confluent with or overlapping R₄₊₅) and anal streak, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a dark basal band, mesonotum red-brown with or without dark markings, abdominal terga III–V orange-brown with variable dark colour patterns, males of some species attracted to cue lure.

***Bactrocera (Bactrocera) furfurosa*, n. sp.**
(Fig. 131)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, attracted to methyl eugenol, 22.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Upper Manki logging area, Bulolo, 25.iii.1980, P. Daur; 1 ♂, Kassam Pass, 19.vi.1980, R.A.I. Drew and D.W. Currey; 1 ♂ (5.i.1981), Mt Missim (1200 m) and 1 ♂ (5.iii.1981), Mt Missim (1250 m), A. Allison. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10521) in QM; 1 paratype in ANIC; 3 paratypes in DPI.

DISTRIBUTION

Known from Oomsis, Bulolo, Kassam Pass and Mt Missim, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots small and irregularly oval; humeral and notopleural calli yellow; mesonotum dark red-brown with 2 narrow lateral longitudinal dark bands, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells with a very pale fulvous tint, microtrichia in outer corner of second costal cell only; abdominal terga III–V black except for a narrow medial longitudinal fuscous band over tergum V and posterior ¼ of tergum IV and dark orange-brown either side of this medial band.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.65 mm. Frons of even width, length 1.48 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles dark fuscous: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with small irregularly oval black spots; length of face 0.48 mm. Genae fulvous, pale brown subocular spot present; dark fuscous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 7–8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.30 mm; 0.85 mm.

Thorax mesonotum dark red-brown except for 2 narrow lateral longitudinal fuscous lines and oval

fuscous markings between humeral and notopleural calli. Pleural areas fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous); 2 lateral postsutural vittae of medium width, narrowing sharply posteriorly to end before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for a narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all femora fulvous; fore and mid tibiae pale fuscous, hind tibiae fuscous; all tarsi fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.3 mm; costal cells with a very pale fulvous tint; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} (paler between R_{2+3} and R_{4+5}) and ending beyond extremity of this vein, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown with a broad transverse fuscous band across anterior $\frac{1}{2}$ but not reaching lateral margins; terga III–V black except for a narrow medial longitudinal fuscous band over tergum V and posterior $\frac{1}{4}$ of tergum IV and dark orange-brown each side of this medial band. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure (the methyl eugenol record on the holotype is assumed in error).

COMMENTS

B. furfurosa is distinct from all other species of the *furfurosa* and *notatagena* complexes in having costal cells colourless or with a very pale tint.

***Bactrocera (Bactrocera) nigrovittata*, n. sp.** (Figs 132–134)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Bulolo, on inflorescence of *Dendrobium bifalce*, 31.vi.1979, N. Howcroft.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 2 ♂♂ (31.vi.1979), Bulolo, on inflorescence of *Dendrobium bifalce*, N. Howcroft; 1 ♀ (2.vii.1979), Robbies Creek, Stony logging area, Bulolo, under leaf of *Musa* sp., H. Ivagai; 1 ♂ (19.vi.1979), Upper Stony logging area, Bulolo, on leaf of *Bambusa* sp., H. Ivagai; 1 ♂ (17.vi.1980), Oomsis logging area, bred ex *Endiandra* sp., R.A.I. Drew and D.W. Currey; 1 ♂ (19.vi.1980), Bulolo, bred ex *Solanum torvum*, J. Simpson; 1 ♂ and 1 ♀ (21.vi.1980), Bulolo, bred ex *Solanum* sp., D.W. Currey; 1 ♂, Station logging area, Bulolo, attracted to sugar, 2.ii.1980, Tom Dama.

LOCATION OF TYPES: Holotype (T.10522) in QM; 2 paratypes in ANIC; 1 paratype in DPI(PNG); 6 paratypes in DPI.

DISTRIBUTION

Known only from Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots very large and oval; humeral and notopleural calli yellow; mesonotum pale fuscous to fuscous with an indefinite broad medial longitudinal black band, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad dark fuscous costal band and anal streak, costal cells fuscous, dense microtrichia covering both costal cells; abdominal terga III–V black except for a narrow transverse orange-brown band across posterior margin of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.44 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with very large oval black spots; length of face 0.55 mm. Genae fulvous, large fuscous subocular spot present; black bristle present. Occiput fuscous, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 dark fulvous, segment 3 fuscous except fulvous on lower

margin; a strong dark dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.22 mm; 0.36 mm; 0.90 mm.

Thorax mesonotum pale fuscous to fuscous with an indefinite broad medial longitudinal black band. Pleural areas dark fuscous except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous), 2 narrow parallel sided lateral postsutural vittae ending at upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow dark fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all coxae dark fuscous; femora dark fuscous except apical $\frac{1}{3}$ of hind femora pale fuscous; fore and hind tibiae pale fuscous, mid tibiae fulvous; all tarsi fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.9 mm; costal cells fuscous, dense microtrichia covering both costal cells; remainder of wings with a pale fuscous tint, dark fuscous subcostal cell, broad dark fuscous costal band confluent with R_{4+5} and overlapping this vein at its extremity, broad dark fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for a broad transverse black band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III–V black except for a narrow transverse orange-brown band across posterior margins of tergum V. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment fuscous, rounded in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.45:1. Apex of piercer broad with a very slight subapical keel (Fig. 133). Spicules at distal end of middle segment small and narrow

with 4–7 dentations of uneven length (Fig. 134). **ATTRACTANT:** No known record.

COMMENTS

B. nigrovittata is similar to *B. notatagena* (May) (*notatagena* complex) and *B. ustulata* (*furfurosa* complex) in possessing fuscous costal cells covered with dense microtrichia and humeral calli entirely yellow but differs in having lateral postsutural vittae ending at pa. bristles, abdominal terga mostly black, femora generally dark fuscous and tibiae fuscous (except mid tibiae fulvous).

Bactrocera (Bactrocera) obfuscata, n. sp. (Fig. 135)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 1.iv.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 4 ♂♂, Upper Manki logging area, Bulolo, 1.iv.1980, P. Daur; 1 ♂ (25.ii.1980) and 1 ♂ (6.iv.1980), Upper Manki logging area, Bulolo, P. Daur; 3 ♂♂, Oomsis Forestry Reserve, 22.vi.1980, R.A.I. Drew and D.W. Currey; 1 ♂ (20.xi.1980) and 1 ♂ (4.vi.1981), Mt Missim (1400 m), A. Allison. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10523) and 1 paratype (T.10524) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 7 paratypes in DPI.

DISTRIBUTION

Known only from the Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized pear shaped facial spots present; humeral and notopleural calli yellow; mesonotum fuscous with irregular dark fuscous patterns, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells pale fuscous, microtrichia covering outer $\frac{1}{2}$ of second costal cell only; abdominal terga III–V dark fuscous except for narrow orange-brown areas either side of a narrow medial longitudinal fuscous band on tergum V and most of tergum IV.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.39 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar

triangle black. Vertex pale fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.45 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput pale fuscous, fulvous along eye margins; occipital row with 2-5 well developed black bristles. Antennae with segments 1 and 2 fulvous (except pale fuscous laterally on segment 2), segment 3 fulvous except fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.35 mm; 0.88 mm.

Thorax mesonotum fuscous to dark fuscous with irregular paler patterns. Pleural areas dark fuscous except fuscous below humeral calli. Yellow markings as follows: humeral calli (anterior $\frac{1}{3}$ plus lower margin fuscous); notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior 5/9 lower hypopleural calli (remainder including broad ventral margin dark fuscous); 2 lateral postsutural vittae of medium width narrowing slightly posteriorly to end behind, at or just before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow dark fuscous basal band. Bristles: sc. 2 (3 in holotype); prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous except apices of fore and hind femora red-brown to pale fuscous, basal $\frac{1}{2}$ of fore and hind tibiae dark fuscous (apical $\frac{1}{2}$ fuscous); rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.9 mm; costal cells pale fuscous; microtrichia covering outer $\frac{1}{2}$ of second costal cell only; remainder of wings with a very pale tint across membrane, fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} (but paler between R_{2+3} and R_{4+5}), broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad transverse dark fuscous band across anterior $\frac{2}{3}$ and widening to cover lateral margins; terga III-V mostly dark fuscous except for narrow orange-brown areas either side of a narrow medial longitudinal fuscous band on tergum V and most of tergum IV. A pair of oval

dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a moderately deep concavity on posterior margin. ATTRACTANT: Cue lure.

COMMENTS

B. obfuscata is similar to *B. popondettiensis* in possessing pale coloured costal cells without microtrichia in first cell. It differs from this species in having humeral calli with anterior $\frac{1}{3}$ fuscous, costal cells pale fuscous with microtrichia in outer $\frac{1}{2}$ of second costal cell only, mesonotum dark fuscous with paler patterns, legs fulvous except apices of fore and hind femora red-brown to pale fuscous and fore and hind tibiae fuscous (darker basally).

Bactrocera (Bactrocera) popondettiensis, n. sp. (Fig. 136)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Northern District: Popondetta, 28.x.1966, T.V. Bourke.

LOCATION OF TYPE: Holotype (T.10525) in QM.

DISTRIBUTION

Known only from Popondetta, Northern District, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots medium sized and pear shaped; humeral and notopleural calli yellow; mesonotum fuscous, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad pale fuscous costal band and anal streak, costal cells pale fulvous, microtrichia covering all of second costal cell and outer corner of first costal cell; abdominal terga III-V orange-brown with a broad transverse fuscous band across anterior $\frac{1}{2}$ of tergum III and 2 broad lateral and a moderately broad medial longitudinal fuscous bands over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.52 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle fuscous. Vertex fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.43 mm. Genae fulvous, pale brown

subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–5 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista dark fuscous (fulvous basally); length of segments: 0.18 mm; 0.33 mm; 0.73 mm.

Thorax mesonotum fuscous except brown below and behind lateral vittae. Pleural areas fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder fuscous); 2 broad lateral postsutural vittae narrowing slightly posteriorly to end at upper pa. bristles. Postnotum fuscous. Scutellum yellow except for narrow fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except hind tibiae pale fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.3 mm; costal cells pale fulvous, microtrichia covering second costal cell and outer corner of first costal cell; remainder of wings colourless except fuscous subcostal cell, broad pale fuscous costal band confluent with R_{4+5} and ending midway between extremities of R_{4+5} and M, broad pale fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except anterolateral corners dark fuscous and a broad transverse fuscous band narrowing laterally to end before lateral margins; terga III–V orange-brown except for a broad transverse fuscous band across anterior $\frac{1}{2}$ of tergum III, 2 broad lateral longitudinal bands which are fuscous on tergum III and pale fuscous on terga IV and V and a moderately broad medial longitudinal fuscous band over all 3 terga. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. popondettiensis is similar to *B. obfuscata* in the characters listed in the comments on this species. It differs from *B. obfuscata* in having costal cells pale fulvous with microtrichia covering all of second costal cell, humeral calli entirely yellow, mesonotum uniformly fuscous and legs fulvous except hind tibiae pale fuscous.

Bactrocera (Bactrocera) ustulata, n. sp.

(Fig. 137)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, attracted to cue lure, 22.vi.1980, R.A.I. Drew and D.W. Currey.

Paratype, PAPUA NEW GUINEA, Central District: 1 ♂, Rigo road (32 km from Port Moresby), attracted to cue lure, 24.vi.1980, R.A.I. Drew and D.W. Currey.

LOCATION OF TYPES: Holotype (T.10526) in QM; paratype in DPI.

DISTRIBUTION

Known from the Morobe Province and Central District, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots medium sized and pear shaped; humeral and notopleural calli yellow; mesonotum pale fuscous with dark fuscous to black patterns, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fuscous, microtrichia covering both costal cells; abdominal terga III–V orange-brown except for a very narrow indefinite medial longitudinal pale fuscous band and 2 broad lateral longitudinal dark fuscous to black bands over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.52 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.43 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 5–6 well developed black bristles. Antennae

with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.78 mm.

Thorax mesonotum pale fuscous except for 2 lateral longitudinal dark fuscous to black bands running from near prsc. bristles to anterior margin, dark fuscous along inner posterolateral margins of lateral postsutural vittae and between humeral and notopleural calli. Pleural areas fuscous except red-brown below humeral calli and black on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices fuscous); anterior 3/5 lower hypopleural calli (remainder fuscous); 2 lateral postsutural vittae of medium width, narrowing posteriorly to end before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous except fore tibiae pale fuscous, hind tibiae fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.2 mm; costal cells fuscous; microtrichia covering second and most of first costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} but paler above this vein, broad fuscous anal streak ending at margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad transverse fuscous band across anterior 1/3 and widening to cover lateral margins; terga III–V orange-brown except for a very narrow indefinite medial longitudinal pale fuscous band and 2 broad lateral longitudinal bands which are dark fuscous to black on tergum III and dark fuscous on terga IV and V (these bands meet along anterior margin of tergum III at which point they are dark fuscous). A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a moderately deep concavity on posterior margin. ATTRACTANT: Cue lure.

COMMENTS

B. ustulata is similar to *B. notatagena* (May) (*notatagena* complex) and *B. nigrovittata* (*furfurosa* complex) in having yellow humeral calli and fuscous costal cells covered with dense microtrichia. It differs from *B. nigrovittata* in having the lateral postsutural vittae ending before the upper pa. bristles, abdominal terga not entirely dark coloured and legs not entirely fuscous. It differs from *B. notatagena* in having the mesonotum pale fuscous with 2 lateral longitudinal dark fuscous to black bands, legs fulvous except fore tibiae pale fuscous and hind tibiae fuscous, abdominal terga III–V with an indefinite narrow medial longitudinal pale fuscous band and broad lateral longitudinal bands which are black on tergum III and dark fuscous on terga IV and V.

mayi complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for narrow costal band (not confluent with R_{4+5}) and anal streak, costal cells colourless and without microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a narrow dark basal band, mesonotum red-brown with or without dark colour patterns, abdominal terga III–V without distinct dark colour patterns on lateral margins, males attracted to methyl eugenol.

Bactrocera (Bactrocera) mayi (Hardy), n. comb. (Figs 138–140)

Not *Dacus bilineatus* Walker, 1860: 150.

Strumeta bilineata Perkins and May, 1949: 7–8; May, 1953: 14, 1963: 43–4, 50.

Dacus (Strumeta) mayi Hardy, 1951: 161–2 (replacement name).

Dacus (Bactrocera) mayi: Drew, 1982: 31–3.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); type series of Perkins and May.

LOCATION OF TYPES: Lectotype ♀ (T.5249) and 1 paralectotype ♂ (T.5250) in QM; 145 paralectotypes in UQ.

DISTRIBUTION

PREVIOUSLY RECORDED: Large populations throughout the entire coastal and subcoastal areas of Queensland (type locality, Cairns), particularly associated with rainforests.

NEW RECORDS: Torres Strait islands: Badu, Horn, Saibai, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dark red-brown with fuscous markings, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V dark red-brown with a narrow medial longitudinal black band, pale fuscous colouration over all 3 terga joined along anterior margin of tergum III by a transverse dark fuscous band.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment dark red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ovipositor to length of tergum V 0.61:1. Apex of piercer needle shaped with 4 pairs of small subapical bristles (Fig. 139). Spicules at distal end of middle segment narrow with 2 or 3 large elongate dentations (Fig. 140). **ATTRACTANT:** Methyl eugenol.

COMMENTS

B. mayi is similar to *B. pallida* (Perkins and May) and *B. tenuifascia* (May) (*mayi* complex) in possessing colourless costal cells, abdominal terga III–V with a distinct medial longitudinal fuscous band, wings colourless except for narrow costal band and anal streak, mesonotum red-brown, medial postsutural vitta absent, lateral postsutural vittae present, humeral and notopleural calli yellow. It differs from *B. pallida* in having a broad anal streak and the mesonotum and abdomen red-brown to dark red-brown. It differs from *B. tenuifascia* in having the lateral postsutural vittae narrow and tapering sharply posteriorly, abdominal terga dark red-brown, mesonotum dark red-brown with a pair of longitudinal parallel black bands centrally.

Perkins and May (1949) did not define type specimens, stating only that the species was "described from a series of over one hundred specimens." Two specimens each labelled holotype in QM can be identified from label data as part of the original series: 1 female (T.5249), Cairns, Queensland, 12.ix.1937, F.A. Perkins, bred from *Sideroxylon obovatum*; 1 male (T.5250), Cairns, Queensland, 12.ix.1937, F.A. Perkins, bred from *Sideroxylon obovatum*. The remainder of the type

series is in UQ. I designate the female (T.5249) as lectotype and the remaining specimens as paralectotypes.

Hardy (1951) noted that the name *bilineata* was preoccupied in *Dacus* and proposed the name *mayi* as a replacement. Although now placed in *Bactrocera*, a junior secondary homonym replaced before 1961 is permanently invalid (Article 59b of the International Code of Zoological Nomenclature).

Bactrocera (Bactrocera) pallida

(Perkins and May), n. comb. (Figs 141–143)

Strumeta pallidus Perkins and May, 1949: 10–12; May, 1963: 47, 50.

Dacus (Strumeta) pallidus: Hardy, 1951: 164–5.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); type series of Perkins and May.

LOCATION OF TYPES: Lectotype ♀ (T.5254) in QM; 12 ♂ ♀ paralectotypes in UQ.

DISTRIBUTION

PREVIOUSLY RECORDED: Although the type specimens were recorded from Cairns (type locality) and Brisbane, *B. pallida* now appears to be restricted to the Atherton Tableland and the coastal rainforest areas of Queensland north from Ayr and the Northern Territory.

NEW RECORDS: Torres Strait islands: Badu, Thursday, Yam (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V pale orange-brown except for a transverse fuscous to dark fuscous band along anterior margin of tergum III and a medial longitudinal fuscous to dark fuscous band over all 3 terga and 2 lateral longitudinal bands which are pale fuscous on tergum III and paler fuscous on tergum IV.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.42 times breadth; fulvous with pale

fuscous around orbital bristles; anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex pale fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.48 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 3–5 bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.78 mm.

Thorax mesonotum generally red-brown without dark markings but occasionally there are longitudinal pale fuscous irregular spots. Pleural areas red-brown with fuscous on sternopleuron and along anterior margin of mesopleural stripe. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, generally reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); 2 lateral postsutural vittae narrowing slightly posteriorly to end at or just before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 5.7 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I pale fuscous; tergum II orange-brown tending fulvous along posterior margin either side of midline, with a narrow pale fuscous to fuscous transverse line. Terga III–V pale orange-brown except for a narrow transverse fuscous to dark fuscous band across anterior margin of tergum III, a moderately broad medial longitudinal fuscous to dark fuscous band over all 3 terga and 2 lateral longitudinal bands of medium width

which are pale fuscous on tergum III and paler fuscous on tergum IV. A pair of oval pale orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ovicape to length of tergum V 0.79:1. Apex of piercer needle shaped with 4 pairs of small subapical bristles (2 large and 2 small) (Fig. 142). Spicules at distal end of middle segment of medium width with 5 to 9 small dentations of uneven length (Fig. 143).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. pallida is similar to *B. mayi* (Hardy) and *B. tenuifascia* (May) in the characters listed under the comments on *B. mayi*. It differs from these species in having a narrow anal streak, mesonotum pale red-brown and abdominal terga pale orange-brown.

Perkins and May did not designate type specimens in their description. The authors stated that the species was "described from a series of 16 specimens." One female labelled holotype (T.5254), Cairns, Queensland, 29.iii.1938, F.A. Perkins, bred from *Sarcocephalus cordatus*, is in QM and from label data can be identified as part of the original type series. Twelve specimens are in UQ with label data conforming with the type series. Because label data alone is not satisfactory for establishing a holotype, I designate the female specimen (T.5254) as lectotype and the remaining specimens as paralectotypes. Usually Perkins and May placed holotype labels on a male and female of each species.

Bactrocera (Bactrocera) tenuifascia (May), n. comb. (Figs 144–146)

Strumeta tenuifascia May, 1965: 64–6.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6315) in QM.

DISTRIBUTION

Known from Berrimah and Nightcliff (type locality) in the Northern Territory and the northern part of Western Australia.

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a narrow transverse pale fuscous to dark fuscous band along anterior margin of tergum III and widening to cover lateral margins of that tergum and a medial longitudinal dark fuscous to black band over all 3 terga but ending in centre of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.59 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fuscous. Face fulvous with medium sized oval black spots; length of face 0.5 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 3–6 red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.78 mm.

Thorax mesonotum red-brown with a mottled appearance due to sites of attachment of dorsoventral flight muscles. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 moderately broad lateral postsutural vittae narrowing posteriorly to end at upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces

of fore femora; mid tibiae each with an apical black spur.

Wings length 5.3 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I and II red-brown tending fulvous along posterior margin of tergum II either side of midline; terga III–V orange-brown except for a narrow transverse pale fuscous to dark fuscous band along anterior margin of tergum III and widening to cover lateral margins, and a medial longitudinal dark fuscous to black band over terga III–V but ending in centre of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.84:1. Apex of piercer needle shaped and slightly pointed at tip with 4 pairs of small subapical bristles (Fig. 145). Spicules at distal end of middle segment of medium width, some with 6–8 small dentations of equal size and others with 3–6 elongate broad dentations of uneven size (Fig. 146).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. tenuifascia is similar to *B. mayi* (Hardy) and *B. pallida* (Perkins and May) (*mayi* complex) in the characters listed in the comments on *B. mayi*. It differs from *B. pallida* in having a broad anal streak and *B. mayi* in having broad parallel sided lateral postsutural vittae, mesonotum red-brown and seldom marked with fuscous colouration and abdominal terga red-brown.

musae complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for narrow costal band (not confluent with R_{4+5}) and anal streak, lateral postsutural vittae present; medial postsutural vitta absent, costal cells colourless and

without microtrichia, scutellum mostly yellow with a narrow dark basal band, mesonotum mostly black, abdominal terga III–V mostly orange-brown, males attracted to methyl eugenol.

Bactrocera (Bactrocera) bancroftii
(Tryon), n. comb. (Figs 147–149)

Chaetodacus bancroftii Tryon, 1927: 199–201.

Strumeta bancroftii: May, 1963: 43, 50.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: Lectotype ♂ (D.3130) and 2 ♀ paralectotypes (D.3130) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Coastal areas of Queensland (type locality, Gympie district).

NEW RECORDS: Torres Strait islands: Badu, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized circular black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow except with a pale fuscous to fuscous apical spot in some specimens; legs entirely fulvous; wing with a narrow fuscous costal band and a broad fuscous anal streak, costal cells very pale fulvous with microtrichia in outer corner of second costal cell only; all abdominal terga uniformly orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.63 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized circular black spots; length of face 0.5 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 5–6 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.33 mm; 0.80 mm.

Thorax mesonotum generally dull black except brown below and behind lateral postsutural vittae, around mesonotal suture, between humeral and notopleural calli, inside humeral calli (in some specimens there is a red-brown area on posterior margin of mesonotum). Pleural areas red-brown except fuscous along anterior margin of mesopleural stripe and black on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous); 2 broad parallel sided lateral postsutural vittae ending at upper pa. bristles. Postnotum black. Scutellum yellow except for a narrow black basal band and a pale fuscous to fuscous apical spot in some specimens. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.0 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga uniformly orange-brown except posterior margin of tergum II tending fulvous. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering slightly posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.45:1. Apex of piercer broad and needle shaped with 4 pairs of small subapical bristles (Fig. 148). Spicules at distal end of middle segment of medium width with 10–14 small dentations of uneven length (Fig. 149). **ATTRACTANT:** Weakly attracted to methyl eugenol.

COMMENTS

B. bancroftii is similar to *B. contermina* and *B. contigua* (*assita* complex) in possessing a black mesonotum with yellow humeral and notopleural calli, scutellum with a narrow black basal band, lateral postsutural vittae present, medial postsutural vitta absent, pale fulvous costal cells, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle and facial spots distinct. It differs from these species in having abdominal terga III–V uniformly orange-brown, distinct brown spot on apex of scutellum, costal band narrower than subcostal cell beyond extremity of R_{2+3} and in the shape of the apex of the piercer and spicules on the middle segment of the ovipositor.

Tryon (1927) designated a holotype, allotype and 1 paratype without defining which specimen is the holotype, and each specimen bears white labels marked "TYPE D/3130". I designate the male as lectotype and the 2 females as paralectotypes.

Bactrocera (Bactrocera) musae
(Tryon), n. comb. (Figs 150–152)

Chaetodacus musae Tryon, 1927: 197–9.

Dacus ornatissimus Froggatt, 1909: 93 (partim, paralectotypes only); Drew 1974a: 64.

Chaetodacus tryoni var. *musa* Tryon, 1927: 187–8 (nomen nudum).

Chaetodacus musae var. *dorsopicta* Tryon, 1927: 198.

Dacus (Strumeta) musae: Hardy, 1951: 162–4; Drew, 1974a: 63–6.

Strumeta musae: May, 1953: 58–9, 1963: 50, 66–7.

Dacus (Bactrocera) musae: Drew, 1982: 35–8.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: *C. musae*, lectotype ♀ (D.3128), 1 ♂, 2 ♀ paralectotypes (D.3128) and 1 ♂ paralectotype (D.3129) in QM; *D. ornatissimus*, 5 paralectotypes (both sexes) in NSW; var. *musa* and var. *dorsopicta*, no types designated.

DISTRIBUTION

PREVIOUSLY RECORDED: Occurs in large populations along the eastern coast of Queensland north from Mt Spec, 65 km north from Townsville (type locality, Meringa), Papua New Guinea and associated islands, Bismarck Archipelago and the Solomon Islands.

NEW RECORDS: Torres Strait islands: Badu, Boigu, Darnley, Dauan, Hammond, Horn, Moa (Banks), Murray, Prince of Wales, Saibai, Stephens, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present; medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V may vary from uniformly orange-brown to orange-brown with a fuscous to black medial longitudinal band and fuscous to black anterolateral corners on tergum III (Fig. 150 A–E).

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dosoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.89:1. Apex of piercer needle shaped with 3 or 4 pairs of subapical bristles (Fig. 151). Spicules at distal end of middle segment narrow to medium in width with 3–6 dentations, 2–3 long and narrow and the remainder small (Fig. 152).

HOST PLANTS

NEW RECORDS: *Syzygium bamagense* (Myrtaceae), Lockerbie and Cape York, Queensland, December 1974, D.J. Rogers.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. musae was described adequately by Drew (1974a, 1982). It is similar to *B. finitima* and *B. tinomiscii* (*assita* complex) in possessing a black mesonotum with lateral postsutural vittae present and ending at pa. bristles and medial postsutural vitta absent, humeral and notopleural calli yellow, scutellum yellow with a narrow dark basal band and costal cells colourless. It differs from *B. tinomiscii* in having the costal band dark and extending well below R_{2+3} , apex of piercer of ovipositor not curved upwards and subapical sensory bristles on piercer of ovipositor consisting of 2 large and 2 small each side and from *B. finitima* in having the costal band not extending almost to R_{4+5} , piercer of ovipositor narrowing sharply between gonopore and apex and spicules at distal end of middle segment with up to 5 large dentations and occasional small dentations.

Tryon (1927) defined 2 holotypes, an allotype

and 2 paratypes, now in QM with white labels: 1 female with "TYPE D/3128" and "Meringa Q, 8.6.26, Ex. Banana"; 1 female "TYPE D/3128" and "Meringa Q, 8.6.26, Ex. Banana"; 1 male and 1 female on the same pin "TYPE D/3128" and "Geraldton, Host. Banana, Bred in office 12.10.1909"; 1 male "TYPE D/3129" and "Native Banana, Cardwell, 12.i.26". Since the type status of each specimen is unclear, I designate 1 female (D.3128) as lectotype (a single female on one pin and labelled lectotype) and the remaining 4 specimens as paralectotypes. In the same paper, prior to the description of *B. musae* as a species, Tryon mentioned a var. *musa* of *tryoni* (Froggatt) but did not describe it except by host data. Therefore the name is unavailable (Article 12c of the International Code of Zoological Nomenclature). Tryon also described a var. *dorsopicta* of *B. musae* in a footnote. This name is valid but the variety is not distinguishable from typical *B. musae*.

***Bactrocera (Bactrocera) prolixa*, n. sp.**
(Fig. 153)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Western District: Nomad, attracted to methyl eugenol, 17.xi.1980, P. Senat.
LOCATION OF TYPE: Holotype (T.10527) in QM.

DISTRIBUTION

Known only from Nomad, Western District, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present; medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdomen elongate-oval, abdominal terga II–V orange-brown except for narrow pale fuscous margins on tergum V and a very narrow medial longitudinal pale fuscous band on anterior $\frac{2}{3}$ of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.52 times breadth; fulvous with pale fuscous around orbital bristles and on

anteromedial hump, latter covered with a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized pear shaped black spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4–5 well developed fuscous bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong fulvous dorsal bristle on segment 2; length of segments: 0.23 mm; 0.33 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, along mesonotal suture, between humeral and notopleural calli, inside humeral calli. Pleural areas dark fuscous to black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder including broad ventral margins dark fuscous to black); 2 lateral postsutural vittae of medium width and narrowing posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.8 mm; costal cells colourless; microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I and sterna I and II as wide as long. Tergum I dark fuscous except for a very narrow transverse orange-brown band across posterior margin but not reaching lateral margins; terga II–V orange-brown except for an irregularly shaped transverse fuscous pattern across anterior margin of tergum II, narrow lateral pale fuscous margins on tergum V and a very narrow

medial longitudinal pale fuscous band on anterior $\frac{2}{3}$ of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. prolixa is similar to *B. brevistriata* (Drew) and *B. commina* (assita complex) in possessing a black mesonotum, humeral and notopleural calli yellow, scutellum yellow with a narrow dark basal band, wings colourless except for costal band and anal streak and lateral postsutural vittae ending before upper pa. bristles. It differs from *B. commina* in having costal cells colourless and abdominal terga II–V mostly orange-brown and from *B. brevistriata* in having the abdomen elongate-oval with terga II–V uniformly orange-brown and costal band overlapping R₂+3.

nigella complex

DEFINITION OF COMPLEX: *Bactrocera* species generally with clear wing membrane except for costal band and anal streak, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a narrow dark basal band, mesonotum and abdominal terga entirely black, males attracted to methyl eugenol.

Bactrocera (*Bactrocera*) *batemani*, n. sp. (Fig. 154)

TYPE SPECIMENS

Holotype ♂, AUSTRALIA, south-east Queensland: Mt Glorious, attracted to methyl eugenol, 25.i.1978, B. McCulloch.

Paratypes, AUSTRALIA, south-east Queensland: 2 ♂♂ (25.i.1978), Mt Glorious, B. McCulloch; 1 ♂ (12.ix.1978) and 1 ♂ (19.ix.1978), Mt Glorious, M. Romig; 10 ♂♂ (16.xii.1981), Mt Glorious (650 m), R.A.I. Drew; 1 ♂ (24.v.1976) and 1 ♂ (5.iv.1977), Cooloolool, B. McCulloch; 1 ♂ (30.ix.1977), Cooloolool, D. Hancock; 1 ♂ (14.xi.1978), Brisbane, G. Hooper. North Queensland: 7 ♂♂ (9.ii.1975), Finch Hatton Gorge, R.A.I. Drew. All paratypes attracted to methyl eugenol.

LOCATION OF TYPES: Holotype (T.10528) and 1 paratype (T.10529) in QM; 8 paratypes in ANIC; 2 paratypes in BMNH; 14 paratypes in DPI.

DISTRIBUTION

Occurs primarily in the high altitude rainforests throughout eastern Queensland, some specimens have been collected at lower altitudes in Brisbane, Cooloolool and Finch Hatton Gorge.

DIAGNOSIS

Medium sized black species; medium sized oval facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fuscous, microtrichia covering outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V black.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.64 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized oval black spots not reaching epistoma; length of face 0.53 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 5–7 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong dark dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.28 mm; 0.88 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 4/7 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width and narrowing sharply posteriorly to end well before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; all other segments fulvous except hind tibiae fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.3 mm; costal cells fuscous,

microtrichia covering outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except dark fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} except for a narrow colourless area above R_{4+5} (this band is pale fuscous between R_{2+3} and R_{4+5}), broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse orange-brown band across posterior margin, but not reaching lateral margins; tergum II orange-brown except for a broad transverse black band across anterior margin and expanding to cover lateral margins; terga III–V black except for a narrow transverse dark fuscous band across posterior margin of tergum V. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. batemani is similar to *B. anthracina* (Drew) (*anthracina* complex) in possessing coloured costal cells with microtrichia in outer corner of second costal cell only, mesonotum and abdominal terga mostly black and wings colourless except for costal band and anal streak but differs in having the lateral postsutural vittae narrowing sharply to end before the upper pa. bristles and all leg segments fulvous except hind tibiae fuscous.

This species is named after Dr M.A. Bateman, Sydney, in recognition of his contributions to fruit fly research during the past 30 years.

Bactrocera (Bactrocera) kelaena, n. sp. (Fig. 155)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Central District: Moresby–Bereina road (88 km from Port Moresby), attracted to methyl eugenol, 26.Vi.1980, R.A.I. Drew and D.W. Currey.
LOCATION OF TYPE: Holotype (T.10530) in QM.

DISTRIBUTION

Known only from Central District, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized irregularly oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe broad extending to humeral

callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia covering all of both costal cells; abdominal terga III–V uniformly black.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.52 times breadth; fulvous with pale fuscous around orbital bristles; anteromedial hump with a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized irregularly oval black spots; length of face 0.45 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fuscous, fulvous along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.25 mm; 0.78 mm.

Thorax mesonotum black except brown behind lateral postsutural vittae. Pleural areas black without pale markings. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe (extending to humeral callus dorsally), continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width and ending at upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black except for the prsc. which are very small.

Legs all coxae dark fuscous; femora fulvous except hind femora tending fuscous on apex; fore and mid tibiae fuscous, hind tibiae dark fuscous; all tarsal segments fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.0 mm; costal cells fuscous; microtrichia covering second and most of first costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except for a narrow transverse orange-brown band along intersegmental line between terga I and II but not reaching lateral margins; tergum II orange-brown except for a broad transverse black band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III–V uniformly black. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. kelaena is similar to *B. caliginosa* (Hardy) (*anthracina* complex) in possessing coloured costal cells with dense microtrichia covering all of second and most of first costal cells, wings colourless except for costal band and anal streak, mesonotum and abdominal terga mostly black but differs in having lateral postsutural vittae parallel sided and ending at upper pa. bristles, scutellum with a narrow dark basal band and mesopleural stripe reaching humeral callus above.

Bactrocera (Bactrocera) nigella (Drew), n. comb. (Fig. 156)

Strumeta nigella Drew, 1968b: 78–9.

Dacus (Strumeta) nigellus: Drew, 1972a: 21.

MATERIAL EXAMINED

A series of specimens (including 1 paratype) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype σ (T.6612) in QM.

DISTRIBUTION

Known only from Mt Kaindi and Wau (type locality), Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; small black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, first costal cell colourless, second costal cell colourless with fulvous distally and along subcostal vein, microtrichia in outer corner of second costal cell only; abdominal terga III–V black.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. nigella was described adequately by Drew (1968b). It is similar to *B. terminaliae* and *B.*

aterrima (Drew) (*anthracina* complex) in having a black mesonotum, abdominal terga mostly black and costal cells colourless or almost colourless. It differs from *B. aterrima* in possessing a narrower mesopleural stripe (not extending past the midline between anterior margin of notopleural callus and anterior npl. bristle) and lateral postsutural vittae extending to upper pa. bristles and from *B. terminaliae* in having all leg segments fulvous except hind tibiae fuscous and small triangular facial spots.

notatagena complex

DEFINITION OF COMPLEX: *Bactrocera* species without well defined fuscous patterns on wing membrane except for broad costal band (confluent with R₄₊₅) and anal streak, costal cells covered with microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a narrow dark basal band, males of some species attracted to methyl eugenol.

Bactrocera (Bactrocera) notatagena (May), n. comb. (Fig. 157)

Strumeta notatagena May, 1952: 337–9; May, 1963: 50.

MATERIAL EXAMINED

Holotype σ ; a series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype (T.5277) in QM.

DISTRIBUTION

Known only from Atherton and coastal areas around Cairns (type locality), north Queensland, Australia.

DIAGNOSIS

Medium sized species; large elongate-oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with irregular pale fuscous to fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous and in some specimens fore and mid femora pale fuscous to fuscous; wing with a broad fuscous costal band and anal streak, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III and IV red-brown and tergum V fulvous except for broad lateral longitudinal bands which are dark fuscous on terga III and IV, anterolaterally on tergum V and red-brown posterolaterally on tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.6 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large elongate-oval black spots in antennal furrows; length of face 0.38 mm. Genae fulvous, dark fuscous subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of short pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.75 mm.

Thorax mesonotum red-brown with irregular pale fuscous to fuscous patterns. Pleural areas fuscous to dark fuscous. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous); 2 lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for dark fuscous basal band which varies in width. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all coxae dark fuscous; remaining segments fulvous except hind tibiae pale fuscous and in some specimens the fore and mid femora pale fuscous to fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.8 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings with a pale fuscous tint, except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous; tergum II fulvous except for broad transverse fuscous band across anterior $\frac{1}{3}$ and widening to cover lateral margins; terga III and IV red-brown and tergum V fulvous except for broad lateral longitudinal dark bands which are

dark fuscous on terga III, IV and anterolateral corners of V and red-brown posterolaterally on tergum V. A pair of oval red-brown shining spots on tergum V. Basal segment of ovipositor fuscous, conical, oval in transverse cross section and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 0.71:1.

ATTRACTANT: No known record. Earlier record of attraction to methyl eugenol (Drew and Hooper, 1981) is doubtful.

COMMENTS

B. notatagena is similar to *B. ustulata* and *B. nigrovittata* (*furfurosa* complex) in possessing entirely yellow humeral calli and costal cells fuscous and covered with dense microtrichia. It differs from *B. nigrovittata* in having the lateral postsutural vittae ending before the upper pa. bristles, leg segments not entirely fuscous and abdominal terga not entirely dark coloured and from *B. ustulata* in having the mesonotum red-brown with a dark fuscous lanceolate pattern, abdominal terga III–V with broad lateral longitudinal dark fuscous bands and legs with fore and mid femora and hind tibiae fuscous.

Originally, May (1952) designated only a female holotype. Three males in QM labelled allotype and paratypes respectively (designated by May, 1957b) and two specimens in DPI labelled paratypes were not part of the original type series, and cannot be considered types.

Bactrocera (Bactrocera) romigae

(Drew and Hancock), n. comb. (Fig. 158)

Dacus (Bactrocera) romigae Drew and Hancock, 1981: 75–7.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8295) in QM.

DISTRIBUTION

Widespread throughout Cape York Peninsula, Queensland (type locality, Iron Range).

DIAGNOSIS

Medium sized species; large black facial spots present; posterior $\frac{2}{3}$ of humeral calli yellow (anterior $\frac{1}{3}$ fuscous); notopleural calli yellow; mesonotum dark red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad dark fuscous costal band and broad fuscous anal streak,

costal cells fuscous, dense microtrichia covering both costal cells; abdominal tergum III dark fuscous, terga IV and V with broad lateral longitudinal dark fuscous bands, tergum V with a broad medial longitudinal fuscous band and the shining spots on tergum V are generally fuscous to dark fuscous.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. romigae was described adequately by Drew and Hancock (1981). It is similar to *B. nigrovittata* and *B. ustulata* (*furfurosa* complex) and *B. notatagena* (May) (*notatagena* complex) in possessing fuscous costal cells covered by dense microtrichia but differs in having the anterior $\frac{1}{3}$ of each humeral callus fuscous and the posterior $\frac{2}{3}$ yellow.

quadrata complex

DEFINITION OF COMPLEX: *Bactrocera* species without well defined fuscous patterns on wing membrane except for narrow costal band and anal streak, costal cells without microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with narrow dark basal band, mesonotum red-brown (with or without dark colour patterns), abdominal terga III–V with narrow indistinct dark coloured patterns on lateral margins of some or all of these terga, males attracted to cue lure.

Bactrocera (Bactrocea) antigone (Drew and Hancock), n. comb. (Fig. 159)

Dacus (Bactrocera) antigone Drew and Hancock, 1981: 59–61.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8248) in QM.

DISTRIBUTION

Known only from Cape York Peninsula, Queensland (type locality, Iron Range).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous, microtrichia in outer corner of second

costal cell only; abdominal terga III–V orange-brown with a broad medial longitudinal dark fuscous to black band and 2 narrow lateral longitudinal fuscous to dark fuscous bands.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. antigone was described adequately by Drew and Hancock (1981). It is similar to *B. erubescens* (Drew and Hancock) and *B. peninsularis* (Drew and Hancock) (*quadrata* complex) in possessing mesonotum and abdominal terga basically orange-brown or red-brown with a medial fuscous stripe on terga III–V, narrow lateral dark colour patterns on some or all of these terga and wings colourless except for costal band and anal streak. It differs from these species in having broad lateral fuscous markings on terga III–V and the medial longitudinal band well defined over all 3 terga.

Bactrocera (Bactrocera) aurantiaca (Drew and Hancock), n. comb. (Fig. 160)

Dacus (Bactrocera) aurantiacus Drew and Hancock, 1981: 62–3.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8254) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Known from the tip of Cape York Peninsula, Queensland (type locality, Lockerbie) and the Torres Strait islands: Horn and Yam.

NEW RECORD: Papua New Guinea, East Sepik District: 2 ♂♂, Maprik, Oct.–Dec., 1957, collector unknown.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum orange-brown with or without dark markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga mostly fulvous with a narrow transverse fuscous to black band across anterior margin of tergum III, narrow lateral dark margins on terga III–V and a narrow medial longitudinal dark band on terga IV and V.

ATTRACTANT: Cue lure.

COMMENTS

B. aurantiaca was described adequately by Drew and Hancock (1981). It is similar to *B. quadrata* (May) (*quadrata* complex) in having the medial longitudinal fuscous band only on terga IV and V, in addition to the characters defining the *quadrata* complex but differs in having an orange-brown mesonotum, abdominal terga III–V with a very narrow lateral fuscous margin and femora and tibiae fulvous.

Bactrocera (Bactrocera) erubescens

(Drew and Hancock), n. comb. (Fig. 161)

Dacus (Bactrocera) erubescens Drew and Hancock, 1981: 64–6.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8259) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Known from Cape York Peninsula, Queensland (type locality, Weipa) and Badu I. (Torres Strait islands).

NEW RECORD: Papua New Guinea, Central Province: 1 ♂, 32 km from Port Moresby on the Rigo road, 24.vi.1980, R.A.I. Drew and D.W. Currey.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V orange-brown with a narrow transverse dark band across anterior margin of tergum III, narrow dark lateral margins and a medial longitudinal dark band over all 3 terga.

ATTRACTANT: Cue lure.

COMMENTS

B. erubescens was described adequately by Drew and Hancock (1981). It is similar to *B. antigone* (Drew and Hancock) and *B. peninsularis* (Drew and Hancock) in possessing a distinct medial longitudinal fuscous band on terga III–V in addition to the characters defining the *quadrata* complex. It differs from *B. antigone* in having

broad lateral fuscous margins on tergum III and narrower dark margins on terga IV and V and from *B. peninsularis* in having the lateral postsutural vittae tapering posteriorly, costal band almost confluent with R_{4+5} and hind tibiae fuscous on basal $\frac{2}{3}$.

Bactrocera (Bactrocera) peninsularis
(Drew and Hancock), n. comb. (Fig. 162)

Dacus (Bactrocera) peninsularis Drew and Hancock, 1981: 70–2.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8263) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Known from Cape York Peninsula, Queensland (type locality, Lockerbie) and the Torres Strait islands: Badu, Horn, Moa, Prince of Wales.

NEW RECORDS: Papua New Guinea, Western District: 1 ♂, Morehead, 27–29.viii.1970, T. Fenner. Torres Strait islands: Boigu, Murray, Saibai, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe ending just before anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless to very pale fulvous, microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdominal terga III–V orange-brown with red-brown to pale fuscous on lateral margins of tergum III.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. peninsularis was described adequately by Drew and Hancock (1981). It is similar to *B. antigone* (Drew and Hancock) and *B. erubescens* (Drew and Hancock) in the characters listed in the comments on *B. erubescens*. It differs from *B. antigone* in having broad lateral fuscous margins only on tergum III and from *B. erubescens* in having broad parallel sided lateral postsutural vittae, narrow costal band and just overlapping R_{2+3} and hind tibiae fulvous.

Some specimens of *B. peninsularis* from the Torres Strait islands show dark abdominal colour patterns as in *B. barringtoniae* (Tryon).

The host of *B. barringtoniae* (*Barringtonia calypttrata*) is also known from some Torres Strait islands: Dauan, Hammond, Murray and Thursday. The 2 species are maintained pending study of host reared specimens from the area.

Bactrocera (Bactrocera) quadrata
(May), n. comb. (Fig. 163)

Strumeta quadrata May, 1962b: 530-2; May, 1963: 50.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPES: Holotype ♂ (T.5897) in QM; 9 paratypes in QM and 37 paratypes in DPI.

DISTRIBUTION

PREVIOUSLY RECORDED: Eastern coastal areas of Queensland (type locality, Atherton).

NEW RECORDS: Papua New Guinea, Central District: 1 ♂, Ninoa Estate, 30.xi.1973, J. Stibick; 1 ♂, Crystal Rapids, 5.xi.1973, J. Stibick; 23 ♂♂, Sogeri Plateau, June 1980, R.A.I. Drew and D.W. Currey. West New Britain: 3 ♂♂, Dami Oil Palm Station, collector unknown. Torres Strait islands: Saibai, Sue, Horn (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present and reaching upper pa bristles, medial postsutural vitta absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and anal streak, costal cells very pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown with a broad transverse fuscous band across anterior margin of tergum III and a medial longitudinal fuscous band on terga IV and V and 2 broad lateral longitudinal bands which are dark fuscous on tergum III and very pale fuscous on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.59 times breadth; fulvous with at most, pale fuscous around orbital bristles; anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with large oval black spots; length of face

0.48 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 5-6 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum red-brown without dark markings. Pleural areas pale fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices pale fuscous); anterior 3/5 lower hypopleural calli (remainder pale fuscous); 2 lateral postsutural vittae ending at upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown except sa. weak or absent in some specimens.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous except hind tibiae pale fuscous and apices of femora darker fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 5.7 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R₂₊₃ and ending between extremities of R₄₊₅ and M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad transverse pale fuscous band across anterior 1/2 and widening to cover lateral margins; terga III-V orange-brown except for a broad transverse fuscous band across anterior margin of tergum III, a medial longitudinal fuscous band on terga IV and V, 2 broad lateral longitudinal bands which are dark fuscous on tergum III and very pale fuscous on terga IV and V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. quadrata is similar to *B. aurantiaca* (Drew and Hancock) (*quadrata* complex) in possessing a medial longitudinal fuscous band on terga IV and V in addition to the character defining the *quadrata* complex but differs in having a red-brown mesonotum, lateral fuscous margins only on abdominal tergum III and apices of all femora and hind tibiae fuscous.

recurrens complex

DEFINITION OF COMPLEX: *Bactrocera* species with infuscation on wing as an S-shaped band in addition to costal band and anal streak, mesopleural stripe broad reaching humeral callus dorsally, lateral postsutural vittae present, medial postsutural vitta absent, scutellum entirely yellow; males of some species attracted to cue lure.

Bactrocera (Bactrocera) absidata, n. sp. (Fig. 164)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Mt Susu, Bulolo, hand collected in flight, 13.ii.1979, H. Ivagai.

LOCATION OF TYPE: Holotype (T.10531) in QM.

DISTRIBUTION

Known only from Mt Susu, Bulolo, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized oval facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe broad reaching humeral callus, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, a narrow U-shaped fuscous band across wing, costal cells very pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga II–V orange-brown.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.75 mm. Frons narrowing slightly posteriorly, length 1.4 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a few short dark setae; orbital bristles black: 1 s.or., 2 i.or.;

lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots present; length of face 0.5 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 3–4 small red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista red-brown (fulvous basally); length of segments: 0.23 mm; 0.38 mm; 0.93 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, above mesopleural suture and inside humeral calli. Pleural areas red-brown below humeral calli and above mid coxae, dark fuscous anterior and posterior to mesopleural stripes, black on sternopleuron and above hind coxae. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripes, reaching humeral callus dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight, upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae, rounded posteriorly and ending behind upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous; mid tibiae each with an apical red-brown spur; rows of long pale setae on dorsal and ventral surfaces of fore femora.

Wings length 6.8 mm; costal cells very pale fulvous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a narrow U-shaped fuscous band across wing, broad fuscous anal streak ending at wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; terga II–V orange-brown except for irregular narrow pale fuscous markings along intersegmental lines and on lateral margins. A pair of oval orange-brown shining spots on tergum V. Visible portion of oviscapae orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscapae to length of tergum V 1.48:1. Aculeus strongly sclerotized, red-brown and without lobes at its tip.

ATTRACTANT: No known record.

COMMENTS

B. absidata is similar to *B. resima* (Drew) (*recurrens* complex) in having a U-shaped fuscous band across wing between costal band and hind margin but differs in having abdominal terga III–V orange-brown with narrow pale fuscous lateral margins.

Bactrocera (Bactrocera) anfracta, n. sp.

(Fig. 165)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Milne Bay District: D'Entre Casteaux I., 17–25.vi.1970, T.L. Fenner.

Paratypes, PAPUA NEW GUINEA, Milne Bay District: 1 ♂, 17–25.vi.1970, D'Entre Casteaux I., T.L. Fenner. Western District: 1 ♂, 28.vii.1970, Weam road, Morehead, attracted to Willison's lure, T.L. Fenner. TORRES STRAIT: 1 ♂, Saibai I., July 1976, G. Maroske; 2 ♂♂, Saibai I., attracted to cue lure, 27.x.1979, G. Sanewski; 2 ♂♂, Saibai I., attracted to cue lure, January 1980, D. Currey.

LOCATION OF TYPES: Holotype (T.10532) in QM; 1 paratype in ANIC; 6 paratypes in DPI.

DISTRIBUTION

Known from the Western and Milne Bay Districts, Papua New Guinea and Saibai I. (Torres Strait islands).

DIAGNOSIS

Medium sized species; medium sized circular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe broad reaching humeral callus, scutellum yellow; wing with a broad fulvous costal band and anal streak, a broad S-shaped fulvous band across wing, costal cells very pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga II–V fulvous except for red-brown to pale fuscous lateral margins on tergum III and a narrow medial longitudinal red-brown to pale fuscous band over all 4 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.85 mm. Frons of even width, length 1.93 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized circular black spots present; length of face 0.53 mm. Genae fulvous, pale fuscous subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4–6 pale bristle. Antennae with segments 1 and 2

fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista fuscous (fulvous basally); length of segments: 0.23 mm; 0.35 mm; 0.93 mm.

Thorax mesonotum black except red-brown below and behind lateral postsutural vittae. Pleural areas fuscous except red-brown below humeral calli and black on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching humeral callus dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous); 2 broad parallel sided lateral postsutural vittae, ending behind upper pa. bristles. Postnotum fuscous to dark fuscous. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and pale red-brown.

Legs all segments fulvous; mid tibiae each with an apical black spur; rows of long pale setae on dorsal and ventral surfaces of fore femora.

Wings length 5.8 mm; costal cells very pale fulvous (second cell paler); microtrichia in outer corner of second costal cell only; remainder of wings colourless except fulvous subcostal cell, broad fulvous costal band confluent with R_{4+5} (except for a colourless spot between R_{2+3} and R_{4+5} distal to r–m crossvein), a broad S-shaped fulvous band across wing, a broad fulvous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous to black; terga II–V fulvous except for a narrow medial longitudinal red-brown to pale fuscous band ending in centre of tergum V and narrow red-brown to pale fuscous lateral margins on tergum III. A pair of oval fulvous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. anfracta is similar to *B. redunca* (Drew) in possessing broad parallel sided lateral postsutural vittae ending at or behind upper pa. bristles, wing markings pale fuscous and abdominal terga III without a dark basal band joining lateral longitudinal dark bands but differs in having the abdominal terga mostly orange-brown with a narrow medial longitudinal fuscous band on terga

II–V and anterolateral corners of tergum II fuscous.

Bactrocera (Bactrocera) manskii

(Perkins and May), n. comb. (Figs 166–168)

Strumeta manskii Perkins and May, 1949: 3–5.

Dacus (Strumeta) manskii: Hardy, 1951: 159–61.

Dacus (Strumeta) recurrens: Drew, 1974a: 78–9 (partim, material from Queensland).

MATERIAL EXAMINED

AUSTRALIA, Queensland: lectotype ♀ and paralectotype ♂ each labelled holotype, Cairns, bred from *Strychnos bancroftiana*, 12.ix.1937, F.A. Perkins; 43 paralectotypes (both sexes) in UQ with labels conforming with Perkins and May's (1949) type data; a large series in DPI from north Queensland collected in cue lure traps (see DISTRIBUTION); 3 ♀ and 2 ♂ bred from *Diospyros* sp., Lockerbie, Cape York, 14.x.1976, D. Currey.

LOCATION OF TYPES: Lectotype (T.5246) and 1 paralectotype (T.5245) in QM; 43 paralectotypes in UQ.

DISTRIBUTION

Common in rainforests on the Atherton Tableland and along the eastern coast of Queensland, north from Tully (type locality, Cairns) and Horn I. (Torres Strait islands).

DIAGNOSIS

Small to medium sized species; medium sized subquadrate facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with a pattern of fuscous to dark fuscous markings, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe broad reaching humeral callus, scutellum yellow; wing with a broad fuscous costal band and anal streak, a broad S-shaped fuscous band across wing, costal cells fuscous, microtrichia covering all of second costal cell and outer ½ of first costal cell; abdominal terga III–V orange-brown except for a very broad medial and 2 broad lateral longitudinal dark bands over all 3 terga and connecting along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.4 times breadth; fulvous with or without pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized subquadrate black spots; length of face 0.4 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle

present. Occiput pale fuscous, fulvous along eye margins; occipital row with 4–6 well developed red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.25 mm; 0.73 mm.

Thorax mesonotum red-brown with irregularly shaped longitudinal fuscous to dark fuscous markings (in some specimens these markings merge to cover most of the posterior area of the mesonotum) and large oval fuscous to dark fuscous markings between humeral and notopleural calli. Pleural areas fuscous to dark fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight or slightly concave, upper hypopleural calli (posterior apices fuscous to dark fuscous); anterior ⅔ lower hypopleural calli (remainder fuscous to dark fuscous); 2 lateral postsutural vittae of medium width, narrowing posteriorly to end before upper pa. bristles. Postnotum fuscous to dark fuscous. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown to fuscous.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells fuscous, microtrichia covering all of second costal cell and ½ of first costal cell; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R₄₊₅ and ending between extremities of R₄₊₅ and M, a broad fuscous S-shaped recurved band across wing, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous to dark fuscous; tergum II orange-brown except anterolateral corners dark fuscous and a dark fuscous to black transverse band which reaches lateral margins; terga III–V orange-brown except for a very broad medial longitudinal black band and 2 broad lateral longitudinal bands which are dark fuscous to black on terga III and IV and fuscous to dark fuscous on tergum V (these bands join along anterior margin of tergum III). A pair of oval fuscous shining spots on tergum V. Posterior lobe of

surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and narrowing posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.4:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 167). Spicules at distal end of middle segment wide with 13–16 small dentations of uneven length (Fig. 168).

HOST PLANTS

NEW RECORD: *Diospyros* sp. (Ebenaceae), Lockerbie, Cape York, 14.x.1976, D. Currey.

ATTRACTANT: Cue lure.

COMMENTS

B. manskii (Perkins and May) is distinct from *B. recurrens* (Hering). Hardy (1951) reported sending specimens of *B. manskii* to Dr. Hering for study who stated that the 2 species were separate. Hardy concluded that "it would be necessary to study specimens of *recurrens* from New Guinea in order to be sure that these are synonyms". May (1953), however, synonymised the 2 species without comparing the types and without studying specimens of *B. recurrens* from Papua New Guinea.

A large series of mature specimens (lure collected) from Papua New Guinea and northern Queensland are on hand. These are distinct but closely related species, *B. manskii* occurring in northern Queensland and *B. recurrens* restricted to Papua New Guinea.

B. manskii is similar to *B. recurrens* in possessing the same S-shaped fuscous band across wing but differs in having the mesonotum red-brown with a lanceolate fuscous pattern, lateral postsutural vittae narrow and ending before upper pa. bristles, abdominal terga III–V orange-brown with broad medial and lateral longitudinal fuscous bands joined along anterior margin of tergum III.

Originally, Perkins and May (1949) did not define type specimens but stated that the species was "described from a series of over fifty specimens bred from *Strychnos bancroftiana* Bail. by M.J. Manski at Cairns in September, 1937, and November, 1938". I designate the female specimen (T.5246) in QM as lectotype and the remaining 44 specimens as paralectotypes.

***Bactrocera (Bactrocera) nigrescentis* (Drew), n. comb. (Fig. 169)**

Dacus (Strumeta) nigrescentis Drew, 1971: 72–4.

MATERIAL EXAMINED

A large series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6952) in QM.

DISTRIBUTION

Known from New Britain (type locality, Keravat), Lihir I. and Bougainville I.

DIAGNOSIS

Small species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a Z-shaped fuscous marking across wing, costal cells fuscous, microtrichia covering all of second costal cell and outer $\frac{1}{3}$ of first costal cell; abdominal terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal glossy black bands joined along anterior margin of tergum III.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. nigrescentis was described adequately by Drew (1971). It is similar to *B. anfracta* and *B. redunca* (Drew) (*recurrens* complex) in possessing a Z-shaped fuscous band across wing. It differs from these species in having the lateral postsutural vittae short and ending well before the upper pa. bristles, wing patterns fuscous to dark fuscous and abdominal terga III–V with a broad medial and 2 broad lateral longitudinal black bands joined along anterior margin of tergum III.

***Bactrocera (Bactrocera) recurrens* (Hering), n. comb. (Fig. 170)**

Strumeta (Bactrocera) recurrens Hering, 1941a: 47.

Strumeta recurrens: May, 1963: 50.

Dacus (Strumeta) recurrens: Drew, 1974a: 78–9 (partim, material from Papua New Guinea).

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ recorded in HNHM (unconfirmed by author).

DISTRIBUTION

PREVIOUSLY RECORDED: Papua New Guinea (type locality, Friedrich Wilhelmshafen).

NEW RECORD: Papua New Guinea, Milne Bay District: 1 ♂, Samari I., 17.iv.1970, E. Mann.

DIAGNOSIS

Small species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a narrow S-shaped fuscous band across wing, costal cells fuscous, microtrichia covering second costal cell and outer ½ of first costal cell; abdominal terga III–V fulvous with brown on lateral margins of tergum III and an indefinite pale fuscous medial longitudinal band over all 3 terga. ATTRACTANT: Cue lure.

COMMENTS

B. recurrens was described adequately by Drew (1974a) except that the mesonotum (usually black) is occasionally red-brown with diffuse black markings of variable shape and size.

B. recurrens is similar to *B. manskii* (Perkins and May) (*recurrens* complex) in possessing an S- or Z-shaped fuscous band across wing but differs in having the mesonotum mostly black, lateral postsutural vittae broad and reaching upper pa. bristles, abdominal terga III–V orange-brown with a narrow medial longitudinal pale fuscous band and lateral margins of tergum III pale fuscous.

Bactrocera (Bactrocera) redunca (Drew), n. comb. (Fig. 171)

Dacus (Strumeta) reduncus Drew, 1971: 82–4.

MATERIAL EXAMINED

A large series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6958) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Vanuatu (formerly New Hebrides), (type locality, Vila, Efate I.) and Bougainville I.

NEW RECORDS: Torres Strait Islands: 5 ♂♂, Saibai I., September 1984; specimens from Boigu, Darnley and Yam (records from Plant Quarantine Survey). Also recorded from the Shortland Is (Solomon Islands).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching humeral callus, lateral postsutural vittae present,

medial postsutural vitta absent, scutellum yellow; wing with a broad pale fuscous costal band and anal streak, an S-shaped fuscous band across wing, costal cells dark fulvous (second cell paler), microtrichia in outer corner of second costal cell only; abdominal terga II–V fulvous with a broad medial longitudinal glossy black band over all 4 terga and 2 broad lateral longitudinal glossy black bands over terga III–V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. redunca was described adequately by Drew (1971). It is similar to *B. anfracta (recurrens)* complex) in possessing a Z-shaped fuscous band across wing, broad parallel sided lateral postsutural vittae reaching to or behind upper pa. bristles, wing patterns pale fuscous and abdominal tergum III without a broad dark band across anterior margin. It differs from this species in having the abdomen orange-brown with 2 broad lateral longitudinal black bands on terga III–V and a broad medial longitudinal black band on terga II–V.

Bactrocera (Bactrocera) resima (Drew), n. comb. (Fig. 172)

Dacus (Strumeta) resimus Drew, 1971: 85–6.

MATERIAL EXAMINED

Four paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6961) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Papua New Guinea, Sepik District (type locality, Ambunti).

NEW RECORD: Torres Strait islands: Saibai (record from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and broad pale fuscous anal streak, an indefinite U-shaped pale fuscous pattern across wing, first costal cell pale fulvous, second costal cell colourless, microtrichia in outer corner of second costal cell only; abdominal terga generally fulvous with a narrow medial longitudinal fuscous to black band over terga I–V and pale fuscous on lateral margins of tergum III.

ATTRACTANT: No known record.

COMMENTS

B. resima was described adequately by Drew (1971). It is similar to *B. absidata* (*recurrens* complex) in possessing a U-shaped fuscous band across wing between costal band and hind margin but differs from this species in having the abdominal terga mostly orange-brown with a medial longitudinal fuscous band on terga I–V and the lateral margins of tergum III brown.

silvicola complex

DEFINITION OF COMPLEX: *Bactrocera* species without well defined fuscous patterns on wing membrane except for narrow costal band and anal streak, costal cells without microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with narrow dark basal band, mesonotum red-brown (with or without dark colour patterns), abdominal terga III–V with distinct broad lateral dark fuscous to black markings on all terga, males attracted to cue lure.

Bactrocera (Bactrocera) abscondita
(Drew and Hancock), n. comb. (Fig. 173)

Dacus (Bactrocera) absconditus Drew and Hancock, 1981: 54–7.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8221) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Cape York Peninsula, north from Iron Range (type locality, Bamaga) and the Torres Strait islands: Moa (Banks), Thursday. NEW RECORDS: Torres Strait islands: Badu, Boigu, Horn (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with irregular fuscous markings, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells very pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with broad lateral and medial longitudinal dark bands over all 3 terga and joining along anterior margin of tergum III.

ATTRACTANT: Cue lure.

COMMENTS

B. abscondita was described adequately by Drew and Hancock (1981). It is similar to *B. abundans* and *B. turneri* in possessing fulvous costal cells in addition to the characters defining the *silvicola* complex but differs from *B. turneri* in having the lateral postsutural vittae narrowing posteriorly and ending before or just reaching the upper pa. bristles and the mesonotum with only small fuscous patterns. It differs from *B. abundans* in having the mesopleural stripe reaching the anterior npl. bristle, the basal dark band on the scutellum always narrow and in lacking a coloured tint across the wing membrane.

***Bactrocera (Bactrocera) abundans*, n. sp.**
(Fig. 174)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Missim (1650 m), attracted to cue lure, 30.x.1980, A. Allison.

Paratypes, PAPUA NEW GUINEA, Western Highlands Province, Mt Hagen: 1 ♂ (14.x.1980), 1 ♂ (4.xi.1980), 1 ♂ (18.xi.1980), 1 ♂ (22.iv.1981), 1 ♂ (28.iv.1981), B. Thistleton.

Morobe Province, Mt Missim (1100–1700 m): 1 ♂ (30.x.1980), 1 ♂ (18.xii.1980), 1 ♂ (30.x.1980), 1 ♂ (13.xi.1980), 15 ♂♂ (30.x.1980), 5 ♂♂ (13.xi.1980), 1 ♂ (20.xi.1980), 1 ♂ (19.ii.1981), A. Allison. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10533) and 1 paratype (T.10534) in QM; 8 paratypes in ANIC; 2 paratypes in BMNH; 1 paratype in DPI(PNG); 19 paratypes in DPI.

DISTRIBUTION

Known only from the higher altitude areas of Papua New Guinea (above 1200 m) having been recorded from Mt Missim (Morobe Province) and Mt Hagen (Western Highlands Province).

DIAGNOSIS

Medium sized species; medium sized irregularly oval to pear shaped black facial spots present; humeral and notopleural calli yellow; mesonotum dark red-brown with a complex pattern of dark fuscous markings, mesopleural stripe of medium width ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a fuscous tint through membrane and a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia generally in outer 1/3 of second cell only; abdominal terga III–V orange-brown except for a moderately broad medial and 2 broad lateral longitudinal dark fuscous to black

bands over all 3 terga and joining along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.42 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized pear shaped to irregularly oval black spots; length of face 0.48 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput pale fuscous, fulvous along eye margins; occipital row with 4–7 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum dark red-brown except dark markings as follows: fuscous across posterior region of mesonotum, a small dark fuscous area along inner posterior margins of lateral postsutural vittae, 3 narrow longitudinal dark fuscous patterns running full length of mesonotum, an irregularly oval dark fuscous pattern between humeral and notopleural calli. Pleural areas fuscous to dark fuscous. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices fuscous); anterior 3/5 lower hypopleural calli (remainder including broad ventral margins fuscous to dark fuscous); 2 narrow lateral postsutural vittae narrowing sharply posteriorly to end before upper pa. bristles. Postnotum fuscous to dark fuscous. Scutellum yellow except for narrow to broad fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous.

Legs fore coxae pale fuscous, mid and hind coxae fuscous; all femora fulvous, tending darker apically; fore tibiae pale fuscous, mid tibiae fulvous, hind tibiae fuscous; tarsal segments fulvous except apical 4 segments of all tarsi pale fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.6 mm; costal cells fulvous; microtrichia in outer corner of second costal cell

only; remainder of wings with a very pale fuscous tint, fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development. (In some specimens the microtrichia cover most of second costal cell and the tint across the wing membrane is darker.)

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous centrally, black laterally; tergum II orange-brown except for a broad transverse fuscous band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III–V orange-brown except for a moderately broad medial and 2 broad lateral longitudinal dark fuscous to black bands joining along anterior margin of tergum III and continuing over all 3 terga. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. abundans is similar to *B. abscondita* (Drew and Hancock) and *B. turneri* in possessing fulvous costal cells in addition to the characters defining the *silvicola* complex. It differs from *B. turneri* in the lateral postsutural vittae narrowing posteriorly and ending before or just reaching the upper pa. bristles and the mesonotum with only small fuscous patterns and from *B. abscondita* in having the mesopleural stripe narrower (ending midway between anterior margin of notopleural callus and anterior npl. bristle), a fulvous tint across wing membrane and a broader red-brown basal band on the scutellum.

Bactrocera (Bactrocera) breviaculeus (Hardy), n. comb. (Figs 175–177)

Dacus (Strumeta) breviaculeus Hardy, 1951: 145–8.

Dacus (Bactrocera) breviaculeus: Drew, 1982: 20–1.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ in NMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Eastern coastal areas of Queensland, north from Rockhampton (type locality, Atherton).

NEW RECORDS: Papua New Guinea: Morehead

(Western Province), Sogeri and Hombrom Bluff (Central Province), Popondetta and Safia (Northern District). Torres Strait islands: Moa (Banks), Saibai, Sue, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells extremely pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with broad lateral longitudinal fuscous to black bands and a narrow medial longitudinal pale fuscous band on terga III–V.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment of ovipositor red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscapae to length of tergum V 0.52:1. Apex of piercer needle shaped, narrowing sharply to a point with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 176). Spicules at distal end of middle segment of medium width with 6–9 very small dentations (Fig. 177).

ATTRACTANT: Cue lure.

COMMENTS

B. breviaculeus was described adequately by Hardy (1951) and Drew (1982). It is similar to *B. cinnamea*, *B. quasisilvicola* and *B. rufofuscula* (Drew and Hancock) in possessing colourless costal cells, lateral postsutural vittae ending at or behind the upper pa. bristles and the costal band confluent with or overlapping R_{2+3} . It differs from these species in having the costal band confluent with R_{2+3} and abdominal terga III–V with an indistinct medial longitudinal fuscous stripe which is not joined with the lateral longitudinal fuscous bands along the anterior margin of tergum III.

Although *B. breviaculeus* was recorded from guava (Hardy, 1951) there is doubt about this record (May, 1953). Consequently, the classification of this species as economic (Drew, 1978, 1982) is incorrect.

***Bactrocera (Bactrocera) cinnamea*, n. sp.** (Fig. 178)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 15.iv.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 6 ♂♂ (1600 m) and 1 ♂ (1450 m), Mt Missim, 12.ii.1981, A. Allison; 3 ♂♂ (1600 m) and 1 ♂ (1650 m), Mt Missim, 5.ii.1981, A. Allison; 1 ♂ (1750 m), Mt Kaindi, 11.v.1981, A. Allison; 1 ♂, Upper Manki logging area, Bulolo, 15.iv.1980, P. Daur; all paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10535) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 9 paratypes in DPI.

DISTRIBUTION

Known only from Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots very small and irregular in shape; humeral and notopleural calli yellow; mesonotum with a broad medial longitudinal fuscous area surrounded laterally and posteriorly by irregular dark fuscous patterns, lateral postsutural vittae present; medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless, microtrichia covering outer corner of second costal cell only; abdominal terga III–V orange-brown except for a moderately broad medial and 2 broad lateral longitudinal dark bands over all 3 terga.

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.54 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous with very small irregular fuscous to black spots; length of face 0.48 mm. Genae fulvous, large brown subocular spot present; red-brown bristle present. Occiput pale fuscous, fulvous along eye margins; occipital row with 4–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.33 mm; 0.83 mm.

Thorax mesonotum with a broad medial longitudinal fuscous area which does not reach

posterior margin and which is surrounded laterally and posteriorly by irregular dark fuscous patterns; dark fuscous below and behind lateral postsutural vittae; brown around mesonotal suture. Pleural areas dark fuscous to black except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width, narrowing slightly posteriorly to end just before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4 (5 in holotype); all bristles well developed and dark red-brown.

Legs fore coxae, mid and hind coxae fuscous; all other segments fulvous except fore tibiae pale fuscous and hind tibiae fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.3 mm; costal cells colourless or with a very pale fulvous tint; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad dark fuscous transverse band across anterior 1/2 and widening to cover lateral margins; terga III–V orange-brown except for a moderately broad medial longitudinal band which is dark fuscous on terga III and IV and black on tergum V, 2 broad lateral longitudinal bands which are dark fuscous on terga III and IV and fuscous on tergum V (these bands meet along anterior margin of tergum III at which point they are fuscous). A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a moderately deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. cinnamea is similar to *B. rufofuscula* (Drew and Hancock) in possessing colourless costal cells, lateral postsutural vittae ending at or behind the

upper pa. bristles, costal band overlapping R_{2+3} , abdominal terga III–V with lateral and medial longitudinal dark bands joined along anterior margin of tergum III, mesonotum red-brown with dark markings and legs with femora entirely fulvous. It differs from this species in having the face with very small pale spots, mesonotum with a broad medial longitudinal fuscous area surrounded laterally and posteriorly by irregular dark fuscous to black patterns and abdominal terga covered by a dense golden pubescence.

Bactrocera (Bactrocera) quasisilvicola, n. sp. (Fig. 179)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central District: Rigo road (32 km from Port Moresby), attracted to cue lure, 24.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Central District: 2 ♂♂, Rigo road (32 km from Port Moresby), attracted to cue lure, 24.vi.1980, R.A.I. Drew and D.W. Currey.

LOCATION OF TYPES: Holotype (T.10536) in QM; 1 paratype in ANIC; 1 paratype in DPI.

DISTRIBUTION

Known only from Central District, Papua New Guinea.

DIAGNOSIS

Medium sized species; large irregularly oval facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, lateral postsutural vittae present; medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V dark orange-brown except for a medial and 2 broad lateral longitudinal dark bands connected along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.67 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large irregularly oval black spots; length of face 0.48 mm. Genae fulvous, large brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 5–7 well developed black

bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.28 mm; 0.80 mm.

Thorax mesonotum red-brown with no dark markings. Pleural areas fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing onto sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 parallel sided lateral postsutural vittae of medium width, ending at upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent or very small; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except apices of all femora fuscous, hind tibiae fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 5.5mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black laterally, fuscous centrally; tergum II orange-brown except for a broad transverse dark fuscous band across anterior 1/3 and widening to cover lateral margins; terga III–V dark orange-brown except for a medial longitudinal band which is fuscous on tergum III and dark fuscous on terga IV and V, 2 broad lateral longitudinal bands which are dark fuscous on tergum III and fuscous on terga IV and V (there is a narrow fuscous area joining these longitudinal bands along anterior margin of tergum III). A pair of oval dark orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. quasivulvicola is similar to *B. cinnamea* and

B. rufofuscula (Drew and Hancock) in possessing colourless costal cells, lateral postsutural vittae ending at or behind the upper pa. bristles, costal band overlapping R_{2+3} and abdominal terga III–V with medial and lateral longitudinal fuscous bands joined along anterior margin of tergum III. It differs from these species in having the mesonotum uniformly red-brown without dark markings, costal band narrowing beyond extremity of R_{2+3} and legs with apices of all femora and hind tibiae fuscous.

Bactrocera (Bactrocera) rufofuscula

(Drew and Hancock), n. comb. (Fig. 180)

Dacus (Bactrocera) rufofusculus Drew and Hancock, 1981: 77–9.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8301) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Cape York Peninsula, north from Iron Range (type locality, Captain Billy Creek, near Shelburne Bay).

NEW RECORDS: Torres Strait islands: Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum dark red-brown with a pair of longitudinal fuscous bands, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a narrow medial and 2 broad lateral longitudinal dark bands over all 3 terga and joining along anterior margin of tergum III.

ATTRACTANT: Cue lure.

COMMENTS

B. rufofuscula was described adequately by Drew and Hancock (1981). It is similar to *B. cinnamea* in possessing colourless costal cells, lateral postsutural vittae ending at or behind upper pa. bristles, costal band overlapping R_{2+3} , abdominal terga III–V with lateral and medial longitudinal dark bands joined along anterior margin of tergum III, mesonotum with dark markings and legs with

femora entirely fulvous but differs in having large oval black facial spots, mesonotum dark red-brown with fuscous lateral longitudinal bands and abdominal terga without a dense golden pubescence.

***Bactrocera (Bactrocera) silvicola*
(May), n. comb. (Fig. 181)**

Strumeta silvicola May, 1962a: 68–71; May, 1963: 48, 50.

MATERIAL EXAMINED

Holotype ♂; a large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype (T.5861) in QM.

DISTRIBUTION

Occurs on the Atherton Tableland (type locality) and along the eastern coast of Queensland, north from Cairns. It has not been recorded from the Torres Strait islands where *B. abscondita* (Drew and Hancock), a closely related species occurs.

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except fore tibiae pale fuscous and hind tibiae fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a very broad medial longitudinal black band and 2 broad lateral longitudinal black bands over all 3 terga and joined along anterior $\frac{1}{2}$ of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.67 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized oval black spots; length of face 0.43 mm. Genae fulvous, dark fuscous subocular spot present; dark fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle

on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.25 mm; 0.65 mm.

Thorax mesonotum red-brown except pale fuscous on posterolateral corners and between humeral and notopleural calli. Pleural areas fuscous to dark fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices fuscous); anterior 3/5 lower hypopleural calli (remainder including narrow ventral margins fuscous); 2 lateral postsutural vittae tapering posteriorly to end just before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except fore tibiae pale fuscous and hind tibiae fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.9 mm; costal cells pale fuscous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad fuscous to dark fuscous band across anterior $\frac{1}{2}$ of tergum and widening to cover lateral margins; terga III–V orange-brown except for a very broad medial longitudinal black band and 2 broad lateral longitudinal black bands over all 3 terga and joined along anterior $\frac{1}{2}$ of tergum III by a dark fuscous area. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. silvicola is similar to *B. breviaculeus* (Hardy), *B. cinnamea*, *B. quasisilvicola* and *B. rufofuscula* (Drew and Hancock) in possessing costal cells colourless or with a very pale tint in addition to the characters defining the *silvicola* complex but differs in having the lateral postsutural vittae

ending well before the upper pa. bristles and the costal band overlapping R_{2+3} by a distinct margin.

***Bactrocera (Bactrocera) turneri*, n. sp.**
(Figs 182–184)

TYPE SPECIMENS

Holotype ♂, TORRES STRAIT: Murray I., attracted to bacteria lure, 28.iv.1986, J. Turner.

Paratypes, PAPUA NEW GUINEA, Milne Bay Province: 4 ♂♂, Goodenough I., attracted to cue lure, 4–10.viii.1980, P. Spradbury. SOLOMON IS: 3 ♂♂, Honiara, Guadalcanal I., iii.1986, N.L.H. Krauss; 1 ♂, Point Cruz, Guadalcanal I., attracted to cue lure, 2.iii.1983; 1 ♂, Maloai, Shortland Is, attracted to cue lure, iii.1985, R. Macfarlane. TORRES STRAIT: 16 ♀♀ and 15 ♂♂, Murray I., attracted to bacteria lure, 28.iv.1986, J. Turner; 1 ♂, Stephens I., attracted to bacteria lure, 25.iv.1986, J. Turner.

LOCATION OF TYPES: Holotype (T.10537) and 2 paratypes (T.10538–T.10539) in QM; 10 paratypes in ANIC; 5 paratypes in BMNH; 1 paratype in DPI(PNG); 23 paratypes in DPI.

DISTRIBUTION

Known from Goodenough I., Milne Bay Province (Papua New Guinea), Shortland Is (Solomon Islands) and the Torres Strait islands: Murray and Stephens.

DIAGNOSIS

Medium sized species; medium sized oval facial spots present; humeral and notopleural calli yellow; mesonotum fuscous with lateral and medial longitudinal dark patterns, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous, microtrichia covering outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V orange-brown except for a broad medial and 2 moderately broad lateral longitudinal dark bands connected by a narrow transverse black band across anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.65 mm. Frons narrowing slightly posteriorly, length 1.56 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots; length of face 0.48 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput

spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 2–7 weak dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fuscous; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.35 mm; 0.75 mm.

Thorax mesonotum red-brown with or without mottled dark patterns. Pleural areas black except red-brown below humeral calli and fuscous above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder including ventral margin black); 2 broad lateral postsutural vittae ending at or behind upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa.1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid coxae fuscous, hind coxae dark fuscous; all other segments fulvous except basal $\frac{1}{2}$ of fore tibiae pale fuscous and hind tibiae fuscous; mid tibiae each with an apical black spur; rows of long dark setae on dorsal surfaces of fore femora.

Wings length 6.4 mm; costal cells fulvous (second costal cell slightly paler); microtrichia covering outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for anterolateral corners fuscous and a broad fuscous transverse band across anterior margin but ending before lateral margins; terga III–V orange-brown except for a narrow transverse black band across anterior margin of tergum III, 2 lateral longitudinal dark fuscous bands and a broad medial longitudinal black band over all 3 terga. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$;

supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, conical in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 1.37:1. Apex of piercer needle shaped with 4 pairs of short subapical bristles (Fig. 183). Spicules at distal end of middle segment of medium width with 6–8 small dentations of approximately equal size (Fig. 184).

ATTRACTANT: Cue lure.

COMMENTS

B. turneri is similar to *B. abscondita* (Drew and Hancock) and *B. abundans* in possessing fulvous costal cells in addition to the characters defining the *silvicola* complex. It differs from these species in having the lateral postsutural vittae broad and ending at the upper pa. bristles and the mesonotum with a pair of broad lateral longitudinal black bands. *B. turneri* is also similar to *B. moluccensis* (Perkins) and *B. rutila* (Hering) in general body colour patterns and size. It differs from both species in the shape of the apex of the piercer and from *B. moluccensis* in the shape of the scales of the middle segment of the ovipositor. This species is named after Mr J. Turner, Department of Primary Industries, Brisbane who has undertaken extensive collections of Dacinae throughout Indonesia and the Torres Strait islands.

tryoni complex

DEFINITION OF COMPLEX: *Bactrocera* species with clear wing membrane except for narrow costal band (not confluent with R_{4+5}) and anal streak, costal cells fulvous or fuscous and generally covered with microtrichia, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with narrow dark basal band, mesonotum red-brown (with or without dark colour patterns), abdominal terga generally red-brown with variable dark colour patterns, males attracted to cue lure.

Bactrocera (Bactrocera) aquilonis (May), n. comb. (Figs 185–187)

Strumeta aquilonis May, 1965: 62–4.

Dacus (Bactrocera) aquilonis: Drew, 1982: 18–20.

MATERIAL EXAMINED

Holotype ♂; a series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype (T.6311) in QM.

DISTRIBUTION

Confined to the northern region of the Northern Territory (type locality, Nightcliff) and Western Australia.

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum pale red-brown with fuscous markings, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia covering second costal cell and most of first costal cell; abdominal terga III–V pale orange-brown with pale fuscous along anterior margin of tergum III and widening over lateral margins of that tergum, a medial longitudinal pale fuscous band on terga III and IV.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.5:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (Fig. 186). Spicules at distal end of middle segment of medium width with a row of 9–13 small dentations of uneven length (Fig. 187).

ATTRACTANT: Cue lure.

COMMENTS

B. aquilonis and the very similar *B. tryoni* (Froggatt) are an excellent example of speciation between 2 geographically isolated regions in which endemic species of fruit fly occur, i.e., northeastern and northwestern Australia. Intensive comparative studies of these 2 populations involving morphology, cytology, enzyme electrophoresis, premating and postmating isolation tests have established their identity (Drew and Lambert, 1986).

B. aquilonis and *B. tryoni* are very similar in general body and wing colour patterns. *B. aquilonis* differs in being an overall paler colour with the mesonotum pale red-brown and the abdominal terga generally fulvous without distinct fuscous markings. These species can also be separated on the differences on the ovipositors: apex of aculeus rounded and spicules with 7–10 uniform dentations in *B. tryoni* (Figs 195, 196) compared with the more pointed aculeus and

uneven dentations in *B. aquilonis* (Figs 186, 187). *B. aquilonis*, although reared from commercial host fruits, falls well below *B. tryoni* in pest status. An updated host list has been prepared (Smith et al., in press).

Bactrocera (Bactrocera) melas

(Perkins and May), n. comb. (Figs 188–190)

Strumeta melas Perkins and May, 1949: 12–14; May, 1963: 50.

Dacus tryoni var. *melas*: Hardy, 1951: 168–9.

Dacus (Bactrocera) melas: Drew, 1982: 34–5.

MATERIAL EXAMINED

AUSTRALIA, Queensland: lectotype ♀ and paralectotype ♀, Gayndah, Apr. 1940, A.W.S. May, ex fruit of *Citrus paradisi*; 1 ♀ labelled holotype, Gayndah, bred from grapefruit, 10.iii.1946, A.W.S. May; a series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: Lectotype (T.10602) and paralectotype (T.10603) in QM.

DISTRIBUTION

Known from coastal and subcoastal areas of eastern Queensland but more prevalent in south-east Queensland (May, 1963); type locality, Gayndah.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dark red-brown with dark fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III–V red-brown with fuscous along anterior margin of tergum III and broad fuscous lateral longitudinal bands over all 3 terga.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment dark red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.55:1. Apex of piercer rounded with 4 pairs of subapical bristles (Fig. 189). Spicules at distal end of middle segment of medium width with 4–8 broad dentations of uneven length (Fig. 190).

ATTRACTANT: Cue lure.

COMMENTS

The status of this species was questioned by Drew (1982) as it resembles a melanic form of *B. tryoni* (Froggatt). *B. melas* is similar to *B. neohumeralis* (Hardy) (*tryoni* complex) in having mesonotum and abdominal terga with dark red-brown to fuscous patterns but differs in having yellow humeral calli and the apical ½ of mid and hind femora fuscous. *B. melas* is minor in pest status. The host record of passionfruit (Drew, 1982) is incorrect.

Originally, Perkins and May (1949) did not define type specimens, stating only that the species was described from 4 specimens bred from grapefruit at Gayndah, Nambour and Palmwoods in the autumn of 1939 and 1940. One female labelled holotype (D.5255) in QM but dated 10.iii.1946 cannot be part of the type series. Two females in DPI labelled “Gayndah, Q., Apr. 1940, A.W.S. May, ex fruit of *Citrus paradisi*” are syntypes. I designate 1 of these (labelled “LECTOTYPE, R. Drew”) as lectotype, the other as paralectotype. These have been deposited in QM and the remaining 2 types have not been located.

Bactrocera (Bactrocera) neohumeralis

(Hardy), n. comb. (Figs 191–193)

Not *Dacus humeralis* Bezzi, 1915: 95.

Chaetodacus humeralis Perkins, 1934: 42–3.

Chaetodacus tryoni var. *sarcocephali* Tryon, 1927: 188 (partim, type series).

Dacus (Strumeta) tryoni var. *neohumeralis* Hardy, 1951: 169–70 (replacement name).

Strumeta humeralis: May 1963: 46.

Dacus (Strumeta) neohumeralis: Drew, 1974a: 67.

Dacus (Bactrocera) neohumeralis: Drew, 1982: 40–3.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Perkins' type series.

LOCATION OF TYPES: Lectotype ♀ (T.10604) in QM; 7 paralectotypes (both sexes) in UQ.

DISTRIBUTION

PREVIOUSLY RECORDED: Eastern coastal areas of Queensland (type locality, Cairns), northern New South Wales, Papua New Guinea. More prevalent in northern wet tropical areas than cooler southern areas of Queensland (see Drew, 1982 for map of distribution in Australia).

NEW RECORDS: Torres Strait islands: Badu, Boigu, Darnley, Dauan, Hammond, Horn, Moa (Banks), Murray, Prince of Wales, Saibai, Stephens, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral calli dark brown to fuscous; notopleural calli yellow; mesonotum dark red-brown with dark fuscous to black markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia covering second costal cell and outer ½ of first costal cell; abdominal terga III–V generally dark fuscous to dull black and tending red-brown medially.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around A1 + CuA2; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.35:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (Fig. 192). Spicules at distal end of middle segment narrow and overlapping with 6–8 small dentations of uneven length (Fig. 193).

HOST PLANTS

NEW RECORDS: 3 specimens in *Notalaea* sp. (Oleaceae), Somerset Road (23 km from Bamaga), Queensland, 19.xii.1974, D.J. Rogers, in association with *B. jarvisi* (Tryon) (2 specimens) and *B. kraussi* (Hardy) (29 specimens); in association with *B. aglaiae* (Hardy) in *Ganophyllum falcatum* (Sapindaceae), Kamerunga, north Queensland, 4.i.1977, B. McCulloch.

ATTRACTANT: Cue lure.

COMMENTS

B. neohumeralis is similar to *B. melas* (Perkins and May) (*tryoni* complex) in having the mesonotum and abdominal terga with dark red-brown to fuscous patterns but differs in possessing fuscous to dark fuscous humeral calli.

Originally, Perkins (1934) did not designate type specimens, stating only that the species was "described from 5 males and 10 females". Five females and 3 males in UQ are part of this type series as the label data conform with those published. The remaining types have not been located. I am designating the female from Cairns, Queensland, 14.vii.1933, F.A. Perkins, bred from

mandarins, labelled lectotype (T.10604) as lectotype and 4 females and 3 males as paralectotypes.

Hardy (1951) and May (1953) thought *B. neohumeralis* may be a variety or colour form of *B. tryoni*. Although these 2 species are very similar morphologically, their different daily mating periods (*B. tryoni* at dusk and *B. neohumeralis* during the middle of the day) are good reason to keep them separate.

B. neohumeralis is a species of major economic importance and of equal pest status to *B. tryoni* especially in the tropical areas of Queensland.

Bactrocera (Bactrocera) tryoni

(Froggatt), n. comb. (Figs 194–196)

Tephritis tryoni Froggatt, 1897: 410–2; Froggatt, 1899: 498.

Dacus tryoni: Froggatt, 1909: 79–80, 1910: 865; Malloch, 1931: 263.

Chaetodacus tryoni: Tryon, 1927: 181–3.

Chaetodacus tryoni var. *juglandis* Tryon, 1927: 188.

Chaetodacus tryoni var. *sarcocephali* Tryon, 1927: 188 (partim, type series).

Dacus (Strumeta) tryoni: Hardy, 1951: 167–8; Drew, 1974a: 85–8.

Strumeta tryoni: May, 1963: 48.

Dacus (Bactrocera) tryoni: Drew, 1982: 43–7.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Tryon's type series.

LOCATION OF TYPES: *T. tryoni*, unknown; var. *juglandis*, holotype ♀ (D.3120) in QM; var. *sarcocephali*, lectotype ♀ and 2 ♂ paralectotypes (D.3121) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Occurs in large populations throughout eastern Australia from Cape York (Queensland) to East Gippsland (Victoria). Type localities, Tenterfield and Penrith, New South Wales — not Queensland as reported by Drew (1974a). See Drew (1982) for map of distribution in Australia. It has also been recorded from New Caledonia, Austral Islands, many islands of the Society group and Easter Island (believed eradicated from this island). Since only 3 specimens have been recorded from Papua New Guinea (1 by Drew (1982); 1 male, cue lure, Goraita, Western District, 30.ix.1972, J. Stibick; 1 male, Willison's lure, 6 km east of Morehead, Western District, 30.ix.1972, J. Stibick) in spite of intensive male lure trapping, it is most doubtful that this species is established there. The 3 records are from the Western District, the closest area of Papua New Guinea to Cape York, Queensland.

NEW RECORD: Torres Strait islands: Yam (record from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia covering second costal cell and outer $\frac{1}{2}$ of first costal cell; abdominal terga III–V generally red-brown with a medial and 2 broad lateral longitudinal fuscous bands over all 3 terga and joined along anterior margin of tergum III; paler forms of the abdomen are often present (Fig. 194A).

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.53:1. Apex of piercer rounded with 4 pairs of subapical bristles (Fig. 195). Spicules at distal end of middle segment of medium width with a row of 7–10 small dentations of uniform size (Fig. 196).

HOST PLANTS

NEW RECORD: *Syzygium rubrimolle* (Myrtaceae), Somerset, 11.xii.1974, D.J. Rogers — 3 specimens in association with 4 specimens of *B. jarvisi* (Tryon) and 22 specimens of *B. kraussi* (Hardy).

ATTRACTANT: Cue lure.

COMMENTS

B. tryoni is similar to *B. aquilonis* (May) (*tryoni* complex) in the general colour patterns of the wing, thorax and abdomen but differs in the characters listed under the comments on *B. aquilonis*.

Tryon (1927) described 2 varieties of *B. tryoni*, i.e. *juglandis* and *sarcocephali*. The single type (holotype ♀) of *juglandis* is identical to normal *B. tryoni*. The three types of *sarcocephali* consist of a female and male *B. tryoni* on one pin (labelled "Holotype") and a male *B. neohumeralis* (Hardy) on another pin (labelled "ALLOTYPE" and bred from *Psidium*), not 2 females and 1 male as recorded by Tryon. In the description Tryon appears to be describing *B. neohumeralis* as he stated that the mesonotum was marked with black and the abdomen dark fuscous. Also he cited a

single specimen "reared from *Psidium* fruit" (probably the allotype) and stated that *sarcocephali* was probably a distinct species. The most significant distinguishing feature of *B. neohumeralis* is the dark humeral callus and this was not described. While Tryon may have been describing *B. neohumeralis*, this is not certain. Consequently I am making *sarcocephali* a junior synonym of *tryoni*, rather than have it threaten the junior, but commonly used *B. neohumeralis*. Because a holotype and paratypes were not clearly designated for *sarcocephali*, I designate the female as the lectotype and the 2 males as paralectotypes.

B. tryoni is the major pest species in Australia and is responsible for major control and quarantine programmes. The spread of this species through the South Pacific islands from Australia to Easter Island during the early 1970's is a good example of dispersal of fruit fly pest species into new areas.

SPECIES NOT PLACED IN COMPLEXES

***Bactrocera (Bactrocera) abdofuscata*
(Drew), n. comb. (Fig. 197)**

Dacus (Strumeta) abdofuscatus Drew, 1971: 48–50.

MATERIAL EXAMINED

Two ♂ paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6938) in QM.

DISTRIBUTION

Aroa River, Central District, Papua New Guinea (type locality).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with irregular fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga generally fuscous tending darker laterally.

ATTRACTANT: No known record.

COMMENTS

B. abdofuscata was described adequately by Drew (1971). It is similar to *B. dyscrita* (Drew) in possessing a red-brown mesonotum and abdominal

terga of uniform pale colouration. It differs from *B. dyscrita* in having the abdominal terga entirely fuscous (pale orange-brown in *B. dyscrita*) and the lateral postsutural vittae ending before the upper pa. bristle.

Bactrocera (Bactrocera) abdonigella
(Drew), n. comb. (Fig. 198)

Dacus (Strumeta) abdonigella Drew, 1971: 52–4.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6940) in QM.

DISTRIBUTION

Widespread throughout Papua New Guinea (type locality, Bubia, near Lae) especially in lowland areas and on Daru and Kiwai Is. There is 1 specimen (in DPI) from Mt Hagen, Western Highlands District. It probably does not occur in large populations as only small numbers have been collected in male lure traps.

DIAGNOSIS

Large species; small black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V generally black.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. abdonigella was described adequately by Drew (1971). It is similar to *B. abdofuscata* (Drew) and *B. dyscrita* (Drew) in possessing a red-brown mesonotum, wings with a narrow costal band and costal cells with microtrichia confined to apical portion of second costal cell only. It differs from these species in having abdominal terga III–V entirely black.

***Bactrocera (Bactrocera) aithogaster*, n. sp.**
(Fig. 199)

TYPE SPECIMENS

Holotype ♂, SOLOMON IS, Guadalcanal I.: Honiara, December 1971, N.L.H. Krauss.

Paratype, SOLOMON IS, Guadalcanal I.: 1 ♂, Honiara, December 1971, N.L.H. Krauss.

LOCATION OF TYPES: Holotype (T.10540) in QM; paratype in DPI.

DISTRIBUTION

Known only from Guadalcanal I. (Solomon Islands).

DIAGNOSIS

Small species; facial spots small and irregularly circular; humeral and notopleural calli yellow; mesonotum dark orange-brown with irregular longitudinal dark patterns, lateral postsutural vittae present, medial postsutural vittae absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V pale orange-brown except for 2 broad lateral longitudinal bands which are fuscous on tergum III and pale fuscous on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.35 mm. Frons of even width, length 1.48 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles fuscous: 1 s.or., 2 i.or.; lunule fulvous. Vertex fuscous. Face fulvous with small irregularly circular black spots; length of face 0.43 mm. Genae fulvous, brown subocular spot present; bristle absent. Occiput red-brown, fulvous along eye margins; occipital row with 5 well developed fuscous bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong fulvous dorsal bristle on segment 2; length of segments: 0.15 mm; 0.28 mm.

Thorax mesonotum dark orange-brown except for irregular narrow lateral longitudinal pale fuscous lines. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices pale fuscous); anterior ½ lower hypopleural calli (remainder including ventral margins red-brown); 2 parallel sided lateral postsutural vittae of medium width ending at upper pa. bristles. Postnotum dark orange-brown. Scutellum yellow except for narrow dark orange-brown basal band. Bristles: sc. 2; prsc.

2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous except hind tibiae pale fuscous; rows of short pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.1 mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous; tergum II orange-brown tending whitish except for a broad transverse fuscous band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III–V pale orange-brown except for 2 broad lateral longitudinal bands which are fuscous on tergum III and pale fuscous on terga IV and V (there is an indication of an indefinite narrow medial longitudinal red-brown band on terga IV and V). A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. aithogaster is similar to *B. barringtoniae* (Tryon) in possessing a red-brown mesonotum and abdominal terga III–V with broad lateral longitudinal dark bands and without a medial longitudinal dark band but differs in having a narrower mesopleural stripe (ending midway between anterior margin of notopleural callus and anterior npl. bristle) and lateral postsutural vittae narrow and tapering posteriorly to end at upper pa. bristles.

Bactrocera (Bactrocera) allwoodi (Drew), n. comb. (Fig. 200)

Dacus (Bactrocera) allwoodi Drew, 1979: 79–80.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.7777) in QM.

DISTRIBUTION

Known only from coastal areas of the Northern

Territory, Australia (type locality, Smith Point, Coburg Peninsula).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching just anterior to npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells pale fuscous with microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown except for a narrow medial longitudinal fuscous to dull black band and fuscous lateral margins over all 3 terga.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. allwoodi was described adequately by Drew (1979). It is similar to *B. obscura* (Malloch) in possessing a black mesonotum without lateral and medial postsutural vittae and abdominal terga pale with dark markings but differs in lacking a fuscous spot on apex of scutellum, in having pale fuscous costal cells and abdominal terga III–V red-brown with broad fuscous lateral margins on tergum III, narrow fuscous margins on terga IV and V and a narrow medial longitudinal fuscous to dull black band on terga III–V.

Bactrocera (Bactrocera) amplexiseta (May), n. comb. (Fig. 201)

Strumeta amplexiseta May, 1962a: 66–8; May, 1963: 50.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION). LOCATION OF TYPE: Holotype ♂ (T.5860) in QM.

DISTRIBUTION

Known only from higher altitude rainforests in north Queensland, Australia (type locality, Atherton).

DIAGNOSIS

Medium sized species; small oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with mottled fuscous patterns, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs entirely fulvous; wing with a broad fuscous costal band and anal streak, apical $\frac{1}{2}$ of wing dark fuscous to fuscous, costal cells fuscous with microtrichia covering outer $\frac{1}{3}$ of second costal cell only; abdominal terga I–IV orange-brown except

tergum IV with a transverse black band across posterior margin and a medial longitudinal dark fuscous band, tergum V black.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.7 mm. Frons of even width, length 1.7 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short dark setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small oval black spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 3–6 strong dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.23 mm; 0.33 mm; 0.85 mm.

Thorax mesonotum red-brown with a mottled fuscous pattern. Pleural areas red-brown with pale fuscous on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 broad lateral postsutural vittae widening posteriorly to end behind upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 6.5 mm; costal cells fuscous; microtrichia covering outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R₄₊₅, apical $\frac{1}{2}$ of wing fuscous to dark fuscous, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–IV orange-brown except tergum IV with a black transverse band across posterior margin and a medial longitudinal dark fuscous band, tergum V black. A pair of oval black shining spots on tergum V. Posterior lobe

of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. amplexiseta is similar to *B. pepisalae* (Froggatt) in having a large area of the wing infuscated and in possessing lateral postsutural vittae and facial spots but differs in having a red-brown mesonotum, infuscation covering apical half of wing and abdominal terga III–V orange-brown except posterior $\frac{1}{2}$ of tergum IV and all of tergum V black.

***Bactrocera (Bactrocera) angustifasciata*, n. sp.** (Fig. 202)

TYPE SPECIMEN

Holotype ♂, LIHIR I.: Lakakot Plantation, 8–14.vii.1970, R.M. Berena.

LOCATION OF TYPE: Holotype (T.10541) in QM.

DISTRIBUTION

Known only from Lihir I.

DIAGNOSIS

Medium sized species; large rectangular black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad triangular black marking on dorsal surface which reaches to apex of scutellum; legs fulvous except fore tibiae very pale fuscous, mid tibiae pale fuscous and hind tibiae dark fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, a narrow transverse fuscous band across centre of wing enclosing both crossveins, the r–m crossvein long and oblique, costal cells fuscous with microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdominal terga II–V orange-brown except for a broad medial longitudinal black band over all 4 terga and 2 broad lateral longitudinal black bands over terga III–V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons of even width, length 1.69 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered with a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large rectangular black spots; length of face

0.53 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput black dorsally, fulvous ventrally and along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.40 mm; 1.0 mm.

Thorax mesonotum black without pale markings. Pleural areas black without pale markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width and narrowing sharply posteriorly to end at level of lower pa. bristles. Postnotum black. Scutellum yellow except for a broad triangular black marking on dorsal surface which has its apex between the sc. bristles. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 2; all bristles well developed and black.

Legs all coxae fulvous; all other segments fulvous except fore tibiae very pale fuscous, mid tibiae pale fuscous, hind tibiae dark fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.7 mm; costal cells fuscous; microtrichia covering outer $\frac{1}{2}$ and anterior margin of second costal cell and anterior margin of first costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a narrow fuscous transverse band across wing enclosing both crossveins, a broad fuscous anal streak ending at wing margin; the r–m crossvein is long and oblique as in *B. obliqua* (Malloch); dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; terga II–V orange-brown except for narrow lateral black margins on tergum II, a broad medial longitudinal black band on terga II–V, 2 broad lateral longitudinal black bands running from anterior margin of tergum III to meet along posterior margin of tergum V. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. angustifasciata is similar to *B. unilineata* in possessing one narrow transverse fuscous band across wing enclosing both crossveins, a black mesonotum and a large black triangular marking on dorsal surface of scutellum but differs in having abdominal terga II–V orange-brown with a broad medial longitudinal black band over all 4 terga and 2 broad lateral longitudinal black bands on terga II–V, costal cells fuscous, costal band overlapping R_{2+3} and humeral calli entirely yellow.

Bactrocera (Bactrocera) atra (Malloch), n. comb. (Fig. 203)

Dacus atra Malloch, 1938: 113.

Dacus (Strumeta) ater: Drew, 1974a: 16–17.

MATERIAL EXAMINED

Holotype ♀, Unurau (100–200 ft.), Raivavae I., Austral Is, August 1934, E.C. Zimmerman. This holotype is female, not male as recorded in Malloch's description.

LOCATION OF TYPE: Holotype in BPBM.

DISTRIBUTION

Unurau, Raivavae I., Austral Is (type locality).

DIAGNOSIS

Medium sized species; small fuscous facial spots present; humeral calli glossy black; notopleural calli fuscous to brown; mesonotum glossy black, mesopleural stripe absent, lateral and medial postsutural vittae absent, scutellum glossy black; wing with a narrow pale fulvous costal band and a broad pale fulvous anal streak, a pale fulvous colouration along r–m crossvein, costal cells pale fulvous, microtrichia covering all of second costal cell and outer corner of first costal cell; all abdominal terga glossy black.

ATTRACTANT: No known record.

COMMENTS

B. atra was described adequately by Drew (1974a). It is similar to *B. perfusca* (Aubertin) in possessing an entirely black scutellum but differs from this species in having a pair of black facial spots. In the original description, Malloch (1938) incorrectly used the feminine form *atra* with *Dacus* which is masculine.

Bactrocera (Bactrocera) atramentata (Hering), n. comb. (Fig. 204)

Strumeta atramentata Hering, 1941c: 9–10.

Dacus (Strumeta) atramentatus Drew, 1974a: 17–19.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: 1 ♂ and 1 ♀ syntype in ZMB; 1 ♀ syntype in BMNH.

DISTRIBUTION

Occurs in large populations in New Britain, New Ireland and Lihir I.; type locality, Ralum, Bismarck Archipelago.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral calli dark fuscous; notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle above, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad medial longitudinal triangular black band; wing with a narrow fuscous costal band and broad fuscous anal streak, a pale infuscation along r-m crossvein, costal cells colourless with microtrichia generally covering outer ½ of second costal cell only; all abdominal terga dull black except orange-brown along anterior margin of tergum V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. atramentata was described adequately by Drew (1974a). It is similar to *B. picea* (Drew) in possessing a black mesonotum, uniformly black abdomen and colourless costal cells but differs from this species in having humeral calli dark fuscous, lateral postsutural vittae narrow, the black band on the scutellum narrow, legs with mid femora, apical ½ of hind femora and hind tibiae fuscous and costal band present on wing.

Bactrocera (Bactrocera) barringtoniae (Tryon), n. comb. (Figs 205–207)

Chaetodacus barringtoniae Tryon, 1927: 196–7.

Dacus (Strumeta) barringtoniae: Hardy, 1951: 144–5.

Strumeta barringtoniae: May, 1963: 50.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: Lectotype ♂ and 3 paralectotypes (1 ♂ and 2 ♀ — D.3127) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Rainforest areas of Queensland, north from Cairns (type locality).

NEW RECORDS: Torres Strait islands: Darnley, Thursday, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized to large species; medium sized oval to subquadrate black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae broad and extending posteriorly to upper pa. bristles, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with broad lateral longitudinal bands which are fuscous on tergum III and pale fuscous on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.5 times breadth; fulvous with at most very pale fuscous around s.or. bristles; anteromedial hump covered by a small number of short pale setae; orbital bristles red-brown; 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle dark fuscous. Vertex very pale fuscous. Face fulvous with medium sized circular black spots; length of face 0.5 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–7 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.35 mm; 0.95 mm.

Thorax mesonotum red-brown without dark markings. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior ⅓ lower hypopleural calli (remainder red-brown); 2 broad parallel sided lateral postsutural vittae ending behind upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.8 mm; costal cells colourless; microtrichia in outer corner of second costal cell

only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I pale fuscous; tergum II red-brown tending fulvous along posterior margin each side of midline; terga III–V orange-brown with broad lateral longitudinal bands which are fuscous on tergum III and pale fuscous on terga IV and V. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.6:1. Apex of piercer tapering sharply from subapical setae and rounded at tip, with 4 pairs of subapical bristles (Fig. 206). Spicules at distal end of middle segment of medium width with 7–11 very small dentations of uniform size (Fig. 207).

HOST PLANTS

NEW RECORD: In association with *B. visenda* (Hardy) and *B. musae* (Tryon) from *Garcinia warrenii* (Guttiferae), Mt Lewis, north Queensland, 19.i.1977, B. McCulloch.

ATTRACTANT: Cue lure.

COMMENTS

B. barringtoniae is similar to *B. peninsularis* (Drew and Hancock) (*quadrata* complex) and *B. aithogaster* in possessing abdominal terga III–V orange-brown without a medial longitudinal dark band and a red-brown mesonotum. It differs from *B. peninsularis* in being a larger fly with broad lateral longitudinal dark bands over abdominal terga III–V, and from *B. aithogaster* in having a broader mesopleural stripe reaching almost to anterior npl. bristle and broad parallel sided lateral postsutural vittae ending behind upper pa. bristles.

Originally, Tryon (1927) designated types "Reg. No. Q.M. D.3127. Holo-, Allo- and 2 Paratypes". However, 2 female specimens are on 1 pin and 2 males on another (side by side on micropins) and it is impossible to determine the holotype. On each pin is a white label with "TYPE D/3127". I

designate 1 male (closest to the main pin) as lectotype and the remaining specimens paralectotypes.

Bactrocera (Bactrocera) biarcuata (Walker), n. comb. (Fig. 208)

Dacus biarcuatus Walker, 1865: 122.

Strumeta biarcuatus: Perkins, 1939: 12 (lectotype designation).

Dacus (Strumeta) biarcuatus: Hardy, 1959: 164–5; Drew, 1974a: 19–21.

MATERIAL EXAMINED

Lectotype ♂; a series of specimens in DPI (see DISTRIBUTION); 2 ♂♂ in BMNH labelled "Korovou, Western Province, Solomon Is, 11.x.1984, E. Holoie".

LOCATION OF TYPE: Lectotype in BMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Type ♂, labelled "New Guinea, W.W. Saunders, B.M. 1868–4" (Hardy, 1959). In spite of intensive male lure trapping, *B. biarcuata* has been recorded only in large numbers from Bougainville I. and the Shortland Is (Solomon Islands).

NEW RECORDS: Papua New Guinea, Morobe Province: 1 ♂, Mt Missim (1450 m), 30.x.1980, A. Allison; 1 ♂, Bubia, April–May, 1971, J. Maiyel (both specimens attracted to methyl eugenol).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral calli yellow except upper anterior corner fuscous; notopleural calli yellow; mesonotum shining black, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad black basal band; wing with a broad fuscous costal band and broad dark fuscous anal streak, a very broad dark fuscous pattern across centre of wing, costal cells dark fulvous, dense microtrichia covering both costal cells; all abdominal terga shining black except fuscous along posterior margin of tergum V. ATTRACTANT: Methyl eugenol.

COMMENTS

B. biarcuata was described adequately by Drew (1974a) with additional notes on the type by Hardy (1959). It is similar to *B. confluens* (Drew) in possessing a large transverse fuscous blotch across wing, a black mesonotum with lateral postsutural vittae and humeral calli yellow but differs in having a narrow mesopleural stripe (slightly wider than notopleural callus) and abdominal terga uniformly black. *B. retrorsa* has a very similar wing colour

pattern but differs in lacking postsutural vittae and in possessing black humeral calli and colourless costal cells.

Perkins (1939) designated the lectotype of *B. biarcuata* "by inference of holotype", according to Article 74b of the International Code of Zoological Nomenclature.

***Bactrocera (Bactrocera) buinensis*, n. sp.**
(Fig. 209)

TYPE SPECIMEN

Holotype ♂, BOUGAINVILLE I.: Buin (0–100 m), October 1971, N.L.H. Krauss.

LOCATION OF TYPE: Holotype (T.10542) in QM.

DISTRIBUTION

Known only from Buin, Bougainville I.

DIAGNOSIS

Small species; facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with irregular fuscous markings, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (extending midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow with a broad medial longitudinal red-brown to fuscous band; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer ½ of second costal cell only; abdominal terga I–V orange-brown with a moderately broad medial longitudinal black band on terga III–V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.6 times breadth; fulvous with very pale fuscous spots around orbital bristles; anteromedial hump reduced and covered by a few short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous, medium sized oval black facial spots present; length of face 0.43 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput fulvous, tending black laterally, yellow along eye margins; occipital row with 1–2 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.28 mm; 0.75 mm.

Thorax mesonotum red-brown with irregular dark fuscous patterns between humeral and

notopleural calli and inside lateral postsutural vittae. Pleural areas red-brown except fuscous before and behind mesopleural stripe and dark fuscous on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior 5/8 lower hypopleural calli (remainder red-brown); 2 narrow lateral postsutural vittae tapering posteriorly to end well before upper pa. bristles. Medial postsutural vitta absent. Postnotum black except red-brown medially. Scutellum yellow except for a broad medial longitudinal dark fuscous to red-brown band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs fore coxae fulvous, mid and hind coxae red-brown; remainder of segments fulvous except hind tibiae fuscous; mid tibiae each with an apical black spur.

Wings length 5.3 mm; costal cells fuscous; microtrichia covering outer ½ of second costal cell only; remainder of wings colourless except for a fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and widening slightly in wing apex to end between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga red-brown except for a moderately broad medial longitudinal band which is dark fuscous on tergum III and black on terga IV and V (this band is discontinuous on the intersegmental lines). A pair of oval red-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. buinensis is similar to *B. daruensis* and *B. enochra* (Drew) in possessing a red-brown mesonotum, scutellum yellow with a medial longitudinal red-brown or fuscous band, humeral and notopleural calli not joined by a lateral yellow band, lateral postsutural vittae present, medial postsutural vitta absent, wings colourless except for costal band and anal streak. It differs from *B. enochra* in having yellow humeral calli and fuscous

costal cells and from *B. daruensis* in having irregular fuscous markings on the mesonotum and lateral postsutural vittae short and ending well before the upper pa. bristles.

***Bactrocera (Bactrocera) bullata*, n. sp.**
(Figs 210–212)

TYPE SPECIMENS

Holotype ♀, PAPUA NEW GUINEA, East Sepik District: Abelam, 8 km SSW of Maprik, bred ex *Garcinia* sp., 19.vii.1980, J. Powell.

Paratypes, PAPUA NEW GUINEA, East Sepik District: 3 ♀♀ and 2 ♂♂, Abelam, 8 km SSW of Maprik, bred ex *Garcinia* sp., 19.vii.1980, J. Powell.

LOCATION OF TYPES: Holotype (T.10543) in QM; 1 paratype in ANIC; 4 paratypes in DPI.

DISTRIBUTION

Known only from Abelam, East Sepik District, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow; mesonotum pale, notopleural calli red-brown; red-brown with a pattern of black markings, mesopleural stripe broad reaching to humeral calli, lateral and medial postsutural vittae present, scutellum yellow; legs entirely fulvous except tending pale fuscous on the basal regions of the hind tibiae; wing with a narrow fuscous costal band and broad fuscous anal streak, infuscation along r-m crossvein, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga I–V orange-brown except for a large oval to circular black spot posterocentrally on tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.76 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark facial spots; length of face 0.45 mm. Genae fulvous, subocular spot absent; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 3–6 well developed black bristles. Antennae with all segments fulvous; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.28 mm; 0.70 mm.

Thorax mesonotum pale red-brown except glossy black across posterior margin and 2 narrow lateral longitudinal black bands. Pleural areas pale red-

brown without dark markings. Yellow markings as follows: humeral calli; broad mesopleural stripe, reaching humeral calli dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli; anterior 4/5 lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae beginning anterior of mesonotal suture and ending behind upper pa. bristles; a moderately broad medial postsutural vitta beginning posterior of prsc. bristles and ending in a point posterior of mesonotal suture. Notopleural calli red-brown. Postnotum red-brown centrally, black laterally. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae fulvous; all other segments fulvous except hind tibiae tending pale fuscous basally; mid tibiae each with an apical black spur.

Wings length 5.8 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and widening apically between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin, infuscation around dm-cu crossvein; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; no pecten on tergum III. Tergum I and sterna I and II wider than long. All terga orange-brown except for a large circular to oval black spot posterocentrally on tergum V. A pair of oval orange-brown shining spots on tergum V. Visible portion of oviscapae orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Aculeus strongly sclerotized, red-brown. Ratio of length of oviscapae to length of tergum V 1.27:1. Apex of piercer narrow and rounded bluntly with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 211). Spicules at distal end of middle segment wide with 11–14 dentations, some broad and elongate and some small (Fig. 212).

MALE: As for female except a small dense aggregation of microtrichia around $A_1 + CuA_2$; a well developed bulla around $A_1 + CuA_2$; pecten present on abdominal tergum III; posterior lobe of surstylus short, abdominal sternum V with a moderately deep concavity on posterior margin. ATTRACTANT: No known record.

COMMENTS

B. bullata is similar to *B. cheesmanae* (Perkins) and *B. neocheesmanae* in possessing both lateral and medial postsutural vittae but differs from these

species in having a bulla in the male wing, additional infuscation on dm-cu crossvein only, costal cells colourless without microtrichia and mesonotum mostly red-brown.

***Bactrocera (Bactrocera) buloloensis*, n. sp.**

(Fig. 213)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Morobe Province: Namo Banda logging area, Bulolo, collected on *Anthocephalus* sp. leaf, 24.iii.1980, H. Ivagai.

LOCATION OF TYPE: Holotype (T.10544) in QM.

DISTRIBUTION

Known only from Bulolo, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized irregularly oval black facial spots present; humeral and notopleural calli yellow; mesonotum black except dark fuscous on posterior region, mesopleural stripe of medium width (ending midway between anterior margin of notopleural callus and anterior npl. bristle), lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous, microtrichia covering all of second costal cell and most of first costal cell; abdominal terga III-V orange-brown except for a broad medial and 2 broad lateral longitudinal black bands.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.55 mm. Frons of even width, length 1.56 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized irregularly oval black spots; length of face 0.33 mm. Genae fulvous, pale brown subocular spot present; black bristle present. Occiput dark fuscous, yellow along eye margins; occipital row with 3-5 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a well developed fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.25 mm; 0.70 mm.

Thorax mesonotum black except dark fuscous along posterior margin, below and behind lateral postsutural vittae, between humeral and notopleural calli, inside humeral calli. Pleural areas

dark fuscous except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder including narrow ventral margins black); 2 narrow parallel sided lateral postsutural vittae ending before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; apical 1/3 of all femora dark fuscous, remainder fulvous; fore and hind tibiae dark fuscous, mid tibiae fulvous; apical 4 segments of tarsi fuscous, basal segment fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.9 mm; costal cells pale fuscous; microtrichia covering second costal cell and most of first costal cell; remainder of wings with a pale fuscous tint, fuscous subcostal cell, narrow fuscous costal band confluent with R₂₊₃ and ending between extremities of R₄₊₅ and M, a broad fuscous anal streak ending at wing margin; no dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe weak.

Abdomen oval; terga free; no pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for a broad transverse dark fuscous to black band across anterior 1/2 and expanding to cover lateral margins; terga III-V orange-brown except for a broad medial and 2 broad lateral longitudinal black bands which join along anterior margin of tergum III. A pair of oval fuscous shining spots on tergum V. Visible portion of ov scape red-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Aculeus strongly sclerotized, red-brown, needle shaped at its tip. Ratio of length of ov scape to length of tergum V 1.52:1.

ATTRACTANT: No known record.

COMMENTS

B. buloloensis is similar to *B. congener* in possessing coloured costal cells, mesonotum mostly black and abdominal terga III-V with broad lateral and medial longitudinal black bands. It differs from this species in having dense microtrichia covering second costal cell and outer 1/2 of first costal cell, lateral postsutural vittae

ending at upper pa. bristles, mesopleural stripe of medium width (ending midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum with narrow basal band and apices of femora fuscous.

Bactrocera (Bactrocera) carbonaria
(Hendel), n. comb.

Dacus (Chaetodacus) carbonarius Hendel, 1927b: 61–2.
Dacus (Strumeta) carbonarius: Drew, 1974a: 25.

MATERIAL EXAMINED
None available.

LOCATION OF TYPES: The 4 type specimens in the Hamburg Museum were lost when this museum was destroyed by fire in 1943.

DISTRIBUTION

Known only from New Britain (type locality).

ATTRACTANT: No known record.

COMMENTS

The original description is adequate for placing *B. carbonaria* in the key to species. It is similar to *B. phaleriae* (May) in possessing a uniformly dark coloured scutellum but differs in having the scutellum black (not brown), humeral and notopleural calli black, mesonotum and abdomen entirely black and facial spots present.

Bactrocera (Bactrocera) cheesmanae
(Perkins), n. comb. (Fig. 214)

Apodacus cheesemani Perkins, 1939: 26–8.
Dacus (Apodacus) cheesemani: Hardy, 1955b: 428.
Strumeta cheesemani: May, 1963: 37.
Dacus (Strumeta) cheesemani: Drew, 1974a: 25–7.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).
LOCATION OF TYPE: Holotype ♂ in BMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Widespread in Papua New Guinea (type locality, Kokodo).

NEW RECORD: Torres Strait islands: Yam (record from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; small elongate black facial spots present; humeral and notopleural calli yellow; mesonotum generally fuscous, mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae present, scutellum yellow; wing with a broad fuscous costal band and anal streak, a broad fuscous transverse band across wing, costal

cells fulvous, microtrichia covering second costal cell and outer ½ of first costal cell; abdominal terga III–V orange-brown with irregular broad fuscous markings on lateral margins of all 3 terga.
ATTRACTANT: Methyl eugenol.

COMMENTS

B. cheesmanae was described adequately by Drew (1974a). It is similar to *B. neocheesmanae* in possessing lateral and medial postsutural vittae and a single transverse fuscous band across wing but differs in having a fuscous mesonotum and abdominal terga III–V orange-brown with broad lateral longitudinal fuscous bands.

This species was named by Perkins in honour of the collector, Lucy Evelyn Cheesman. However, in giving the name *cheesemani*, Perkins misspelt it and gave it a masculine ending. It is here corrected under Article 32(d) of the International Code of Zoological Nomenclature.

Bactrocera (Bactrocera) confluens
(Drew), n. comb. (Fig. 215)

Dacus (Asiadacus) confluens Drew, 1971: 35–7.

MATERIAL EXAMINED

Two ♂ paratypes in DPI.
LOCATION OF TYPE: Holotype ♂ (T.6931) in QM.

DISTRIBUTION

Bougainville I. (type locality, Daru Village).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, an irregularly shaped broad fuscous band across centre of wing, costal cells dark fulvous, microtrichia covering second costal cell and outer ½ of first costal cell; abdominal III–V orange-brown except for a broad medial and 2 broad lateral longitudinal black bands which join along posterior margin of tergum V.
ATTRACTANT: Methyl eugenol.

COMMENTS

B. confluens was described adequately by Drew (1971). It is similar to *B. biarcuata* (Walker) in having the transverse band across the wing as a broad dark fuscous blotch but differs from this species in possessing a broad mesopleural stripe extending to anterior npl. bristle and abdominal

terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal black bands joined along posterior margin of tergum V.

***Bactrocera (Bactrocera) congener*, n. sp.**
(Fig. 216)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 25.iii.1980, P. Daur.

LOCATION OF TYPE: Holotype (T.10545) in QM.

DISTRIBUTION

Known only from the Bulolo area, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; small oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow with broad black basal band; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a moderately broad medial and 2 moderately broad lateral longitudinal dark bands connected along anterior margin of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.42 times breadth; fulvous with dark fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex dark fuscous. Face fulvous with small oval black spots; length of face 0.48 mm. Genae fulvous, large fuscous subocular spot present; fuscous bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with 5–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.80 mm.

Thorax mesonotum and pleural areas black. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe,

reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a very small transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for broad black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs coxae dark fuscous; all other segments fulvous except pale fuscous tint on apical areas of fore femora and basal 1/3 of fore tibiae, dark fuscous hind tibiae; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.1 mm; costal cells fuscous (second cell paler than first); microtrichia in outer corner of second costal cell only; remainder of wings with a pale fuscous tint, fuscous subcostal cell, narrow fuscous costal band confluent with R₂₋₃ and ending between extremities of R₄₊₅ and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen oval; terg. free; pecten present on tergum III. Tergum IV and sterna I and II wider than long. Tergum I black except a very narrow transverse orange-brown band posterocentrally; tergum II orange-brown except dark fuscous anterolateral corners and a broad transverse black band across anterior margin; terga III–V orange-brown except for a broad transverse black band across anterior margin of tergum III, 2 moderately broad lateral longitudinal bands which are black on terga III and IV and dark fuscous on tergum V, a moderately broad medial longitudinal black band over all 3 terga. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. congener is similar to *B. buloloensis* in possessing coloured costal cells, costal band confluent with R₂₋₃, mesonotum mostly black and abdominal terga III–V with medial and lateral longitudinal broad black bands. It differs from this species in having microtrichia in outer corner of second costal cells only, lateral postsutural vittae ending before upper pa. bristles, mesopleural stripe narrow (equal in width to notopleural calli), basal

band on scutellum broad and femora entirely fulvous.

Bactrocera (Bactrocera) curvifera
(Walker), n. comb. (Fig. 217)

Dacus curvifer Walker, 1864: 229.

Neodacus curvifer: Perkins, 1939: 21–2.

Dacus (Neodacus) curvifer: Hardy, 1954: 8–10.

Dacus speculifer Walker, 1865: 122; Hardy, 1959: 168, 182 (syn. and lectotype designation).

Dacus (Strumeta) curvifer: Drew, 1974a: 27–30.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: *D. curvifer*, 1 ♂ labelled “type”, “Waigiou, A.R. Wallace, 68–4” in BMNH (not a type, see COMMENTS); *D. speculifer*, lectotype ♂ in BMNH.

DISTRIBUTION

Widespread in lowland rainforests of Papua New Guinea and the following islands: Samarai, Goodenough, New Britain, New Ireland and Lihir; type locality, Waigiou I., Irian Jaya.

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a very large fuscous blotch across centre of wing and a narrow transverse band across apex of wing, costal cells fulvous with second cell tending paler towards centre, microtrichia in outer corner of second costal cell only; abdominal terga III–V generally dark brown to red-brown with a broad medial longitudinal dark band on tergum V. ATTRACTANT: Methyl eugenol.

COMMENTS

B. curvifera was described adequately by Drew (1974a). It is similar to *B. seguyi* (Hering) in possessing a black mesonotum with lateral postsutural vittae, 2 transverse fuscous bands across wing (the centre band as a broad irregular blotch) but differs from this species in having a mesopleural stripe that does not extend to the humeral callus, costal cells fulvous and abdominal terga III–V uniformly dark brown.

Hardy (1959) listed the BMNH specimen of *D. curvifer* as the type, but it is a male. Walker (1864) based his description on a female. Because the specimen mentioned by Hardy cannot be the one referred to in the original description, no valid lectotype designation “by inference of holotype”

was made. Although the male in BMNH labelled “type” may have been part of the original series, there is no evidence that Walker had it before him when describing *D. curvifer*. Hence this male should not be considered a type. The female used for the description is presumed lost. Hardy (1959) designated the lectotype of *D. speculifer* “by inference of holotype”, according to Article 74b of the International Code of Zoological Nomenclature.

Bactrocera (Bactrocera) curvipennis
(Froggatt), n. comb. (Figs 218–220)

Dacus curvipennis Froggatt, 1909: 93.

Strumeta curvipennis: Perkins, 1939: 8–9.

Dacus (Strumeta) curvipennis: Drew, 1974a: 30–2.

MATERIAL EXAMINED

Lectotype ♂ and paralectotype ♂, labelled “syntype, New Caledonia, bred ex mandarins, October 1901, coll. Mr Butler”; a series of specimens in DPI (see DISTRIBUTION); 3 ♀♀ in BMNH from Vanuatu (formerly New Hebrides). LOCATION OF TYPES: Lectotype and paralectotype in NSW.

DISTRIBUTION

PREVIOUSLY RECORDED: New Caledonia (type locality).

NEW RECORD: Vanuatu (formerly New Hebrides): 3 ♀♀ in BMNH labelled “New Hebrides, Aneityum, xi.1930, L.E. Cheesman”.

DIAGNOSIS

Small species; very small pale fuscous facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a broad fuscous band along r-m crossvein, costal cells pale fuscous, microtrichia covering second costal cell and outer corner of first costal cell; abdominal terga III–V orange-brown with a narrow transverse fuscous band along anterior margin of tergum III merging into broad lateral black margins and with anterolateral corners of terga IV and V fuscous.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 2 pairs of subapical bristles (Fig. 219). Spicules at distal end of middle segment of medium width with 4–8 broad dentations of approximately equal length (Fig. 220).

ATTRACTANT: Cue lure.

COMMENTS

B. curvipennis was described adequately by Drew (1974a). It is similar to *B. phaea* (Drew) in possessing infuscation on the r-m crossvein, mesonotum black, scutellum entirely yellow, costal cells coloured and abdominal terga III-V with ground colour orange-brown. It is distinct from *B. phaea* in having the mesopleural stripe not extending to the humeral callus, microtrichia covering second costal cell and outer corner of first costal cell, and abdominal terga III-V orange-brown with a very narrow transverse fuscous band across anterior margin of tergum III which merges into broad lateral black margins and the anterolateral corners of terga IV and V fuscous.

Originally, Froggatt (1909) did not designate a holotype. There are 2 male syntypes (glued side by side together with a pupal case on a card on the same pin) in NSW and I designate the left-hand specimen as lectotype and the other paralectotype.

***Bactrocera (Bactrocera) daruensis*, n. sp.**

(Fig. 221)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western Province: Wyborn's property, Daru I., hand collected in rainforest, 6.vi.1980, R.A.I., Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Western Province: 2 ♂♂, Wyborn's property, Daru I., hand collected in rainforest, 6.vi.1980, R.A.I., Drew and D.W. Currey. TORRES STRAIT: 1 ♂, Murray I., hand collected, 2.v.1984, N. Gough. LOCATION OF TYPES: Holotype (T.10546) in QM; 1 paratype in ANIC; 2 paratypes in DPI.

DISTRIBUTION

Known only from Daru I. (Papua New Guinea) and Murray I. (Torres Strait islands).

DIAGNOSIS

Medium sized species; small irregularly oval black facial spots present; humeral calli yellow; notopleural calli orange-brown; mesonotum red-brown, mesopleural stripe medium sized (reaching to anterior npl. bristle), lateral postsutural vittae very broad and parallel sided, scutellum yellow with a large triangular red-brown marking on dorsal surface; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia covering second costal cell and outer corner of first costal cell; abdominal terga I-V orange-brown except for a moderately broad medial longitudinal black band on terga III-V or on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length

1.65 mm. Frons of even width, length 1.52 times breadth; fulvous without dark markings; anteromedial hump covered with a large number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small irregularly oval black spots; length of face 0.45 mm. Genae fulvous, dark subocular spot absent; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 5-8 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong dark dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.25 mm; 0.78 mm.

Thorax mesonotum red-brown except for a mottled appearance due to sites of attachment of dorsoventral flight muscles. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; medium sized mesopleural stripe, reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 very broad parallel sided lateral postsutural vittae ending at or just behind upper pa. bristles. Notopleural calli red-brown. Postnotum red-brown. Scutellum yellow except for a large triangular red-brown marking on dorsal surface. Bristles: sc. 2 (scutellar bristles absent in one specimen); prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae fulvous; all other segments fulvous except hind tibiae pale fuscous; rows of pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.5 mm; costal cells fulvous; microtrichia covering second costal cell and outer corner of first costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I-V orange-brown except for a moderately broad medial longitudinal black band either on terga III-V or on terga IV and V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. daruensis is similar to *B. buinensis* in possessing fuscous costal cells, yellow humeral calli, red-brown mesonotum and scutellum yellow with a large dark triangle on dorsal surface but differs from this species in lacking dark markings on mesonotum and lateral postsutural vittae parallel sided and reaching upper pa. bristles.

Bactrocera (Bactrocera) diaphana
(Hering), comb. nov. (Fig. 222)

Strumeta diaphana Hering, 1953: 508–9.

Dacus (Strumeta) diaphanus: Drew, 1974a: 32–4.

MATERIAL EXAMINED

Holotype ♀, October 1938, Bernhard Camp, Irian Jaya, J. Olthof.

LOCATION OF TYPE: Holotype in RNH.

DISTRIBUTION

Irian Jaya (type locality, Bernhard Camp).

DIAGNOSIS

Small species; medium sized black facial spots present; humeral calli yellow; posterior $\frac{1}{2}$ of notopleural calli yellow (anterior $\frac{1}{2}$ fuscous); mesonotum red-brown with dark fuscous markings, a broad yellow band running from humeral calli to anterior end of lateral postsutural vittae, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present and beginning anterior to mesonotal suture, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless, microtrichia covering second costal cell and outer corner of first costal cell; abdominal terga III–V fulvous with narrow fuscous bands along anterolateral margins of tergum III and narrow pale fuscous lateral margins on terga IV and V and a pale fuscous medial longitudinal band on tergum V.

ATTRACTANT: No known record.

COMMENTS

B. diaphana was described adequately by Drew (1974a). It is similar to *B. ochromarginis* (Drew) in having the humeral and notopleural calli joined by a lateral yellow band, narrow costal band, red-brown mesonotum with medial postsutural vitta absent and lateral postsutural vittae present but differs in possessing the mesopleural stripe not extending to humeral callus, anterior $\frac{1}{2}$ of notopleural calli fuscous and posterior $\frac{1}{2}$ yellow, lateral postsutural vittae beginning anterior to mesonotal suture and microtrichia covering second costal cell and outer corner of first costal cell.

***Bactrocera (Bactrocera) diospyri*, n. sp.**
(Figs 223–225)

TYPE SPECIMENS

Holotype ♀, AUSTRALIA, Northern Territory: Smith Point, bred ex *Diospyros maritima*, 24.viii.1978, S. Collins.

Paratypes, AUSTRALIA, Northern Territory: 1 ♂, Smith Point, bred ex *Diospyros maritima*, 24.viii.1978, S. Collins. TORRES STRAIT, Yorke I.: 9 ♀♀ and 6 ♂♂, bred ex *Diospyros maritima*, December 1979, G. Sanewski; 4 ♀♀ and 4 ♂♂, attracted to bacteria lure, 24.iv.1986, J. Turner. LOCATION OF TYPES: Holotype (T.10547) and 2 paratypes (T.10548–T.10549) in QM; 6 paratypes in ANIC; 2 paratypes in BMNH; 14 paratypes in DPI.

DISTRIBUTION

Known from coastal areas of the Northern Territory (Australia) and the Torres Strait islands: Sue and Yorke.

DIAGNOSIS

Small black species; large subquadrate facial spots present; mesonotum glossy black, humeral and notopleural calli yellow; lateral and medial postsutural vittae absent, mesopleural stripe medium sized (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless, microtrichia covering outer $\frac{1}{3}$ of second costal cell only; abdomen generally glossy black.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.83 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with large subquadrate black spots reaching epistoma; length of face 0.5 mm. Genae fulvous, large dark fuscous subocular spot present; black bristle present. Occiput black, yellow along eye margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.75 mm.

Thorax mesonotum and pleural areas glossy black with no brown markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron

as a transverse spot, anterior margin strongly convex dorsally; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black). Lateral postsutural vittae absent. Postnotum glossy black. Scutellum yellow except for moderately broad black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles weak and black.

Legs all coxae dark fuscous; femora dark fuscous to black except basal 2/3 of hind femora fulvous; fore tibiae pale fuscous, mid tibiae dark fuscous, hind tibiae dark fuscous to black; tarsi fulvous; mid tibiae each with an apical black spur; rows of long black setae on dorsal surfaces of fore femora.

Wings length 4.9 mm; costal cells colourless, microtrichia covering outer 1/3 of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band just overlapping R₂₊₃ and expanding apically before ending between R₄₊₅ and M, narrow fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around A₁ + CuA₂ absent; supernumerary lobe weak.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. Terga I–V glossy black except 2 narrow fulvous spots along posterior margin of tergum I, a narrow transverse fulvous band along posterior margin of tergum V and extending as narrow fulvous margins along either side of a medial longitudinal black band. A pair of oval fuscous shining spots on tergum V. Basal segment of ovipositor dark fuscous, dorsoventrally compressed and narrowing posteriorly in dorsal view, aculeus strongly sclerotized and red-brown. Ratio of length of ov scape to length of tergum V 0.61:1. Apex of piercer needle shaped with 3 pairs of subapical bristles (Fig. 224). Spicules at distal end of middle segment of medium width, scale-like with 3–5 very broad indistinct dentations (Fig. 225).

MALE: As for female except a dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development; pecten present on abdominal tergum III; posterior lobe of surstylus short, abdominal sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. diospyri is similar to *B. exspoliata* (Hering) in possessing a black mesonotum, uniformly black abdominal terga, scutellum entirely yellow, humeral and notopleural calli yellow but differs from this species in having costal cells colourless, femora black (except basal 2/3 of hind femora fulvous), fore

tibiae fuscous, mid and hind tibiae dark fuscous.

Originally I identified this species as *B. exspoliata* and therefore it was recorded as such by Allwood and Angeles (1979).

Bactrocera (Bactrocera) dyscrita

(Drew), comb. nov. (Fig. 226)

Dacus (Strumeta) dyscrita Drew, 1971: 63–5.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6947) in QM.

DISTRIBUTION

New Britain (type locality, Keravat).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with pale fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing with a broad pale fuscous costal band and anal streak, costal cells pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga uniformly orange-brown.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. dyscrita was described adequately by Drew (1971). It is similar to *B. abdofuscata* (Drew) in possessing colourless wings except for costal band and anal streak, mesonotum red-brown, costal cells colourless with microtrichia in outer corner of second costal cell only, abdominal terga of uniformly pale colouration. It differs from this species in having abdominal terga entirely orange-brown and lateral postsutural vittae ending behind upper pa. bristles.

Bactrocera (Bactrocera) ebenea

(Drew), comb. nov. (Fig. 227)

Dacus (Strumeta) ebeneus Drew, 1971: 65–7.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6949) in QM.

DISTRIBUTION

New Caledonia (type locality, Noumea).

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow except anterodorsal corners fuscous; notopleural calli yellow; mesonotum

glossy black, mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, entire wing membrane with a diffuse fuscous colouration, costal cells pale fuscous with microtrichia in outer $\frac{1}{3}$ of second costal cell only; all abdominal terga glossy black. ATTRACTANT: Methyl eugenol.

COMMENTS

B. ebenea was described adequately by Drew (1971). It is similar to *B. amplexiseta* (May) and *B. pepisalae* (Froggatt) in possessing diffuse infuscation over a large area of the wing membrane but differs from these species in having facial spots and lateral postsutural vittae absent.

Bactrocera (Bactrocera) enochra (Drew), comb. nov. (Fig. 228)

Dacus (Strumeta) enochrus Drew, 1972b: 207–8.

MATERIAL EXAMINED

A series of paratypes in DPI; 2 ♂♂ in BMNH.
LOCATION OF TYPE: Holotype ♂ (T.6993) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Bougainville I. (type locality, Daru Village) and the Shortland Is (Solomon Islands).

NEW RECORD: Solomon Islands: 2 ♂♂ in BMNH labelled "Korovou, Western Province, Solomon Islands, 11.x.1984, E. Holoie".

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral calli brown; notopleural calli yellow; mesonotum red-brown with broad lateral longitudinal dark fuscous to black bands, mesopleural stripe ending just before anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum red-brown except for narrow lateral yellow margins; wing with a narrow pale fuscous costal band and broad pale fuscous anal streak, costal cells pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga mostly orange-brown with 2 broad lateral longitudinal black bands over terga III–V and a broad medial longitudinal black band over terga II–V which join on tergum V. ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. enochra was described adequately by Drew (1972b). It is similar to *B. buinensis* and *B. daruensis* in possessing a dark medial longitudinal

band on the scutellum and a red-brown mesonotum with dark markings. It differs from these species in having the humeral calli brown and costal cells pale fulvous. It is similar also to *B. trifaria* (Drew) in general body colour patterns but this species has a mesonotum almost entirely black, humeral calli black, scutellum with a medial longitudinal black band, legs and abdominal colour patterns darker and occurs in New Britain.

***Bactrocera (Bactrocera) eximia*, n. sp.** (Fig. 229)

TYPE SPECIMENS

Holotype ♀, PAPUA NEW GUINEA, Madang Province: Baku, bred ex stem of *Terminalia brassii*, 30.v.1980, D. Skelton.

Paratypes, PAPUA NEW GUINEA, Madang Province: 1 ♂, Baku, bred ex stem of *Terminalia brassii*, 30.v.1980, D. Skelton. Central Province: 1 ♀, Sirinumu (500 m), hand collected on bushes, 13.vi.1983, J.W. Ismay.

LOCATION OF TYPES: Holotype (T.10550) in QM; 2 paratypes in DPI (both damaged).

DISTRIBUTION

Known from Madang and Central Provinces, Papua New Guinea.

DIAGNOSIS

Small species; facial spots absent, humeral calli yellow; notopleural calli with anterior $\frac{1}{2}$ black and posterior $\frac{1}{2}$ yellow; mesonotum black, mesopleural stripe very broad reaching humeral callus, lateral and medial postsutural vittae present, scutellum yellow; wing with a narrow fuscous costal band and anal streak, a well developed bulla above anal cell extension in male, costal cells pale fuscous, microtrichia covering second costal cell and outer corner of first costal cell; abdominal terga I–V orange-brown except for narrow black margins on terga III and IV and a broad medial longitudinal black band on tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.1 mm. Frons narrowing slightly posteriorly, length 1.69 times breadth; fulvous with fuscous around s.or. bristles and on anteromedial hump, latter covered with a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark facial spots; length of face 0.4 mm. Genae fulvous, without dark subocular spot; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of short pale bristles. Antennae with all segments fulvous; a strong black

dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.10 mm; 0.18 mm; 0.40 mm.

Thorax mesonotum black except red-brown behind lateral postsutural vittae. Pleural areas black except red-brown below humeral calli. Yellow markings as follows: humeral calli; posterior $\frac{1}{2}$ of notopleural calli (anterior $\frac{1}{2}$ black); broad mesopleural stripe, extending to humeral callus dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{1}{3}$ lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae ending behind upper pa. bristles; a broad medial postsutural vitta beginning behind prsc. bristles and narrowing to a point at line of mesonotal suture. Postnotum black. Scutellum yellow except for narrow black basal band which expands laterally into large spots. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; npl. 2; mpl. 1; scp. 4; all bristles well developed and black.

Legs all coxae fulvous; all other segments fulvous except hind tibiae dark fuscous and apical 4 segments of all tarsi fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.7 mm; costal cells pale fuscous; microtrichia covering second costal cell and outer corner of first costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and expanding apically to end at M, a narrow pale fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; no pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V orange-brown except for narrow black margins posterolaterally on tergum III and laterally on tergum IV, a broad medial longitudinal black band on tergum V. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view, aculeus strongly sclerotized, orange-brown, needle shaped at its tip. Ratio of length of oviscape to length of tergum V 1.25:1.

MALE: As for female except a dense aggregation of microtrichia around $A_1 + CuA_2$; a well developed bulla around $A_1 + CuA_2$; supernumerary lobe very strong; pecten present on abdominal tergum III; posterior lobe of surstylus short, abdominal sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

In *B. eximia*, the short third antennal segment and anal cell extension are similar to characters in the subfamily Trypetinae. However, chaetotaxia and other wing venation characters resemble the subfamily Dacinae.

It is distinct from all other species of the subgenus *Bactrocera* in possessing clear wing membranes, lateral and medial postsutural vittae present and in the antennal segment and wing venation characters already stated.

Bactrocera (Bactrocera) exspoliata

(Hering), n. comb. (Fig. 230)

Strumeta exspoliata Hering, 1941b: 54–5.

Dacus (Strumeta) exspoliatus: Drew, 1974a: 37–9.

MATERIAL EXAMINED

Holotype ♂, Kapakapa, Central District, Papua New Guinea, June 1891, L. Loria.

LOCATION OF TYPE: Holotype in HHNM.

DISTRIBUTION

Kapakapa, Central District, Papua New Guinea (type locality).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching anterior npl. bristle, lateral and medial and postsutural vittae absent, a yellow triangle above notopleural calli and running along anterior margin of mesonotal suture, scutellum yellow with a black basal band of medium width; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fulvous (second costal cell paler), microtrichia in outer $\frac{1}{2}$ of second costal cell only; all abdominal terga entirely black.

ATTRACTANT: No known record.

COMMENTS

B. exspoliata was described adequately by Drew (1974a). It is similar to *B. diospyri* in possessing a black mesonotum without lateral and medial postsutural vittae, scutellum yellow, humeral and notopleural calli yellow and abdominal terga uniformly black but differs in having coloured costal cells (pale fulvous) and legs fuscous except fore tibiae fulvous.

Bactrocera (Bactrocera) facialis

(Coquillett), n. comb. (Figs 231–233)

Dacus facialis Coquillett, 1910: 12–13.

Dacus tongensis Froggatt, 1910: 870-1; Malloch, 1931: 263; Perkins, 1939: 9-11 (syn.).

Chaetodacus facialis: Bezzi, 1928: 104.

Strumeta facialis: Perkins, 1939: 9-11 (lectotype designation, as *facialis*, lapsus).

Dacus (Strumeta) facialis: Drew, 1974a: 39-41.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); 1 ♀ in BMNH labelled "Tonga, 11.10.67, W.A. Apt, reared from *Capsicum*"; 32 specimens in BMNH labelled "Tonga, Tongatapu, Tokomololo, 2.x.1975, T. Langi, reared from *Citrus maxima*".

LOCATION OF TYPES: *D. facialis*, lectotype ♂ (No. 12737), 2 ♂ and 3 ♀ paralectotypes in NMNH; *D. tongensis*, unknown.

DISTRIBUTION

Known from Tongatapu I. and the Ha'apai Group, Tonga (type locality).

DIAGNOSIS

Small species; facial spots absent; humeral and notopleural calli yellow; mesonotum dark fuscous to black, mesopleural stripe reaching almost to humeral callus, narrow short lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and narrow pale fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown with a moderately broad medial longitudinal fuscous to black band over all 3 terga, broad lateral fuscous to black margins on tergum III and anterolateral corners of terga IV and V.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 232). Spicules at distal end of middle segment of medium width with 6-9 dentations of approximately even size (Fig. 233). ATTRACTANT: Cue lure.

COMMENTS

B. facialis was described adequately by Drew (1974a). It is similar to *B. mucronis* (Drew) in possessing colourless wings except for costal band and anal streak, black mesonotum, abdomen orange-brown with dark markings and very short lateral postsutural vittae. It differs from this species in having broad black lateral margins on abdominal tergum III and anterolaterally on terga IV and V, a moderately broad medial longitudinal black band on terga III-V and lateral postsutural vittae very short and narrow and ending at level of sa. bristles.

Originally, Coquillett listed the material studied as "Two male and four female specimens, bred from guavas. Type No.12737, U.S. National Museum". I have examined 3 including that labelled type by Coquillett. The remaining 3 types are in NMNH. Dr Allen Norrbom (NMNH, pers. comm.) advised that some confusion surrounds the Coquillett types as to whether or not holotypes were designated in the cases where more than 1 specimen was involved. The specimen labelled type was later labelled lectotype by G. Steyskal because of the description of this specimen by Greene, personally communicated to and published by Perkins (1939). I am treating this specimen as the lectotype (designated by Perkins, "by inference of holotype" according to Article 74b of the International Code of Zoological Nomenclature) and the remaining specimens as paralectotypes. According to Norrbom (pers. comm.) there are 3 male and 3 female types.

Bactrocera (Bactrocera) froggatti (Bezzi), n. comb. (Fig. 234)

Chaetodacus froggatti Bezzi, 1919: 413. New scientific name (see International Code of Zoological Nomenclature page 259) for *Dacus zonatus* of Froggatt, 1910: 868-9, nec *zonatus* Saunders (1841).

Dacus zonatus: Froggatt (nec. Saunders), 1910: 868-9 (misidentification).

Dacus froggatti: Malloch, 1939a: 241-2.

Strumeta froggatti: Perkins, 1939: 15-16 (lectotype designation).

Dacus (Strumeta) froggatti: Hardy and Adachi, 1954: 169-71; Drew, 1974a: 45-7.

MATERIAL EXAMINED

A large series of specimens (including paralectotypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Lectotype ♂ in ANIC (Drew, 1974a).

DISTRIBUTION

Known from the following islands: Banika (type locality), Guadalcanal, Gizo, Russell, Shortland (Solomon Islands) and Bougainville.

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural callus yellow; mesonotum dull black, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, costal cells fulvous (outer costal cell paler), microtrichia in outer corner of second costal cell only; abdominal terga III-V

fulvous with a broad medial and 2 broad lateral longitudinal black bands over all 3 terga.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. froggatti was described adequately by Drew (1974a). It is similar to the species in the *bryoniae* complex in possessing colourless wings except for costal band and anal streak, costal band broad (confluent with R), mesonotum black with lateral postsutural vittae present and medial postsutural vitta absent but differs in having abdominal terga III–V fulvous with distinct broad medial and lateral longitudinal black bands not meeting along anterior margin of tergum III and males attracted to methyl eugenol.

Froggatt (1910) misidentified specimens from Solomon Islands as *Dacus zonatus* Saunders when publishing a description. Bezzi (1919) recognised Froggatt's misidentification and renamed the specimens *Chaetodacus froggatti*. The name *froggatti* is here accepted as a new scientific name under the definition of this term in the Glossary of the International Code of Zoological Nomenclature. The specimens used by Froggatt are regarded as valid types of this species.

Bactrocera (Bactrocera) furvescens, n. sp. (Fig. 235)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 15.iv.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, 18.ii.1980 and 1 ♂, 22.ii.1980, Upper Stony logging area, Bulolo, P. Daur; 1 ♂, Mt Missim (1250 m), 9.iv.1981, A. Allison. Western Highlands District: 1 ♂, 23.vi.1978; 1 ♂, 5.x.1978; 1 ♂, 6.xi.1978; 1 ♂, 8.ix.1980; 1 ♂, 22.ix.1980; 1 ♂, 23.ix.1980; 1 ♂, 28.x.1980; 2 ♂♂, 17.iii.1981; Kuk Agricultural Research Institute, Mt Hagen, B. Thistleton. All above paratypes collected at cue lure. SOLOMON IS, Guadalcanal I.: 1 ♂, Honiara, December 1971, N.L.H. Krauss.

LOCATION OF TYPES: Holotype (T.10551) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 9 paratypes in DPI.

DISTRIBUTION

Known from the Morobe Province and Western Highlands District, Papua New Guinea and Honiara (Solomon Islands).

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral calli fuscous; notopleural calli yellow; mesonotum black tending dark fuscous posteriorly, lateral postsutural vittae

present, medial postsutural vitta absent, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), scutellum yellow with a narrow black basal band; wing with a narrow fuscous costal band and a broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V generally dark fuscous to black tending dark fulvous posterocentrally on tergum IV and centrally on tergum V, either side of a medial longitudinal fuscous band.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.5 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized oval black spots; length of face 0.4 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput pale fuscous, yellow along eye margins; occipital row with 6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.78 mm.

Thorax mesonotum black tending dark fuscous posterocentrally and brown below and behind lateral postsutural vittae. Pleural areas dark fuscous except dark red-brown below humeral calli. Yellow markings as follows: notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder including ventral margins black); 2 lateral postsutural vittae of medium width and narrowing posteriorly to end at upper pa. bristles. Humeral calli fuscous. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl.1; npl. 2; scp. 4; all bristles well developed and dark fuscous to black.

Legs all segments fulvous except fore tibiae pale fuscous and hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.3 mm; costal cells colourless; microtrichia in outer corner of second costal cell

only; remainder of wings colourless except for a fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous except for a narrow fulvous line along posterior margin but not reaching lateral margins; tergum II fulvous except for a transverse fuscous band across anterior $\frac{1}{2}$ and widening to reach lateral margins; terga III–V dark fuscous to black except dark fulvous posterocentrally on tergum IV, fulvous centrally on tergum V each side of a short medial longitudinal fuscous band on posterior area of tergum IV and anterior $\frac{1}{2}$ of tergum V. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. furvescens is similar to *B. neohumeralis* (Hardy) in possessing dark fuscous to black mesonotum and abdominal terga, wings colourless except for costal band and anal streak, notopleural calli yellow, medial postsutural vitta absent and lateral postsutural vittae present but differs in having the mesonotum black (not dark fuscous) and colourless costal cells without dense microtrichia.

Bactrocera (Bactrocera) hispidula

(May), n. comb. (Fig. 236)

Strumeta hispidula May, 1957b: 301–3; May, 1963: 50.

MATERIAL EXAMINED

Holotype ♀, Atherton, north Queensland, 23.iv.1956, A.W.S. May; 1 ♂ labelled allotype, Atherton, north Queensland, 10.iv.1959, A.W.S. May.

LOCATION OF TYPE: Holotype (T.5595) in QM.

DISTRIBUTION

Atherton, Queensland (type locality).

DIAGNOSIS

Small species; facial spots absent; humeral calli yellow; notopleural calli fuscous; mesonotum orange-brown with dark fuscous to fuscous markings, mesopleural stripe broad reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad

fuscous anal streak and narrow infuscation enclosing dm–cu crossvein, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga I–V uniformly orange-brown without dark markings.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.2 mm. Frons of even width, length 1.75 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous without dark spots; length of face 0.43 mm. Genae fulvous, pale brown subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 1–3 dark bristles. Antennae with all segments fulvous; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.25 mm; 0.58 mm.

Thorax mesonotum orange-brown except with a dark fuscous pattern on posterior margin, fuscous between humeral and notopleural calli and inside humeral calli. Pleural areas orange-brown except fuscous on sternopleuron and behind mesopleural stripe. Yellow markings as follows: humeral calli; broad mesopleural stripe, reaching humeral callus dorsally, not continuing to sternopleuron, anterior margin straight; upper hypopleural calli (posterior apices fuscous); anterior $\frac{3}{4}$ lower hypopleural calli (remainder fuscous); 2 parallel sided lateral postsutural vittae ending at upper pa. bristles. Notopleural calli fuscous. Postnotum red-brown to fuscous. Scutellum yellow except for narrow dark fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae fulvous; femora fuscous to dark fuscous except basal $\frac{1}{3}$ of hind femora fulvous; fore tibiae fulvous, mid tibiae fulvous except basal $\frac{1}{3}$ fuscous, hind tibiae fuscous; tarsal segments fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.7 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and widening slightly beyond extremity of this vein to end between extremities of R_{4+5} and M, narrow infuscation enclosing dm–cu crossvein, broad fuscous anal streak ending before wing margin; dense aggregation of

microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V uniformly orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Apex of piercer with 3 pairs of subapical lobes (Fig. 236A). Ratio of length of oviscape to length of tergum V 0.91:1.

ATTRACTANT: No known record.

COMMENTS

Originally, May (1957b) designated a female holotype. A male in QM labelled allotype was designated by May (1962a) but this cannot be considered a type as it was not part of the original series.

B. hispidula is similar to *B. laticaudus* (Hardy) in possessing infuscation on wing on 1 crossvein, scutellum entirely yellow and mesonotum pale coloured but differs in having the mesonotum and abdominal terga generally orange-brown, notopleural calli fuscous, infuscation on dm-cu crossvein and costal cells colourless.

Bactrocera (Bactrocera) honiarae, n. sp.

(Fig. 237)

TYPE SPECIMEN

Holotype ♂, SOLOMON IS: Honiara, Guadalcanal I., March 1986, N.L.H. Krauss.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Known only from Honiara, Solomon Islands.

DIAGNOSIS

Large species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with fuscous colouration over most of membrane, a broad fuscous costal band and anal streak, costal cells fuscous, microtrichia covering second and most of first costal cell; abdominal terga III–V orange-brown with a broad medial and 2 broad

lateral longitudinal black bands joining on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 2.3 mm. Frons of even width, length 1.53 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter prominent and covered with a large number of short black setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large circular black spots; length of face 0.68 mm. Genae fulvous, dark fuscous subocular spot present; black bristle present. Occiput fulvous, pale fuscous dorsally, yellow along eye margins; occipital row with 9–10 strong dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong dark dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.34 mm; 0.55 mm; 1.1 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae and around mesonotal suture. Pleural areas black except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 5/8 lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae narrowing posteriorly to end before upper pa. bristles. Postnotum black. Scutellum yellow except for a narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl.1; npl.2; scp.3; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae dark fuscous; all other segments fulvous except hind tibiae pale fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 8.6 mm; costal cells fuscous; dense microtrichia covering second costal cell and most of first costal cell; remainder of wings with fuscous over most of membrane (darker across centre region) and with a broad fuscous costal band and anal streak; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black except orange-brown across posterior margin; tergum II orange-brown except for a small black spot anterocentrally and fuscous on anterolateral corners; terga III–V orange-brown

except for a broad medial and 2 broad lateral longitudinal black bands joining across most of tergum V. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. honiarae is similar to *B. pepisalae* (Froggatt) in being a large species and having most of the wing infuscated, a black mesonotum, broad lateral postsutural vittae, yellow humeral and notopleural calli and scutellum. It differs from *B. pepisalae* in possessing microtrichia over both costal cells, different fuscous patterns on the wings and abdominal terga III–V with a unique pattern of medial and lateral longitudinal black bands joined across most of tergum V.

Bactrocera (Bactrocera) humilis (Drew and Hancock), n. comb. (Fig. 238)

Dacus (Bactrocera) humilis Drew and Hancock, 1981: 68–70.

MATERIAL EXAMINED

Holotype ♂, 4 km E of Lockerbie, Cape York Peninsula, Queensland, 30.i-4.ii.1975, G.B. Monteith.

LOCATION OF TYPE: Holotype (T.8262) in QM.

DISTRIBUTION

Lockerbie, Queensland (type locality).

DIAGNOSIS

Small species; large black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, first costal cell pale fulvous, second costal cell fulvous, microtrichia covering second costal cell and around margins of first costal cell; abdominal terga III–V fulvous with broad lateral longitudinal fuscous to red-brown bands over all 3 terga and a narrow indefinite medial longitudinal pale red-brown band on terga III and IV.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. humilis was described adequately by Drew and Hancock (1981). It is similar to species in the *tryoni* complex in possessing a red-brown mesonotum, dense microtrichia covering costal cells, facial spots present, abdominal terga pale

coloured with darker markings. It differs from these species in being a very small species and in having costal cells fulvous and abdominal terga III–V with broad lateral longitudinal fuscous to red-brown bands.

***Bactrocera (Bactrocera) ismayi*, n. sp.** (Fig. 239)

TYPE SPECIMENS

Holotype ♂, NEW IRELAND: Lelet Plateau, 3–5.xi.1981, J.W. Ismay.

Paratype, NEW IRELAND: Lelet Plateau, 3–5.xi.1981, J.W. Ismay.

LOCATION OF TYPES: Holotype (T.10552) in QM; paratype in DPI.

DISTRIBUTION

Known only from New Ireland.

DIAGNOSIS

Medium sized dark coloured species; large oval black facial spots present; humeral calli yellow (dorsal and anterior margins black); notopleural calli black; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae very narrow and ending at level of lower pa. bristles, medial postsutural vitta absent, scutellum yellow with a broad medial longitudinal black band; wing with a narrow dark fuscous costal band and broad dark fuscous anal streak, a broad wedge shaped dark fuscous band across centre of wing from costal band and enclosing r–m crossvein, a broad Z-shaped dark fuscous band across wing; abdominal terga I–V black without pale markings.

DESCRIPTION

MALE: Head generally dark fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.65 times breadth; dark fulvous with black extending from the vertex down to the s.or. bristles; anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fulvous. Ocellar triangle black. Vertex black. Face dark fulvous with large oval black spots; length of face 0.5 mm. Genae dark fulvous, black subocular spot present; black bristle present. Occiput black, dark fulvous along eye margins; occipital row with 6 well developed black bristles. Antennae with segments 1 and 2 dark fulvous, segment 3 dark fulvous with black on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (dark fulvous basally); length of segments: 0.20 mm; 0.38 mm; 0.90 mm.

Thorax mesonotum and pleural areas black without pale markings. Yellow markings as follows: humeral calli (except anterior and dorsal margins black); medium sized mesopleural stripe, ending midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 very narrow lateral postsutural vittae beginning posterior to mesonotal suture and ending at level of lower pa. bristles. Notopleural calli black. Medial postsutural vitta absent. Postnotum black. Scutellum yellow except for a broad medial longitudinal black band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae dark fuscous, mid and hind coxae black; fore femora with basal $\frac{1}{2}$ fulvous, apical $\frac{1}{2}$ and lateral and ventral margins dark fuscous to black; mid femora black; hind femora with basal $\frac{1}{2}$ fulvous, apical $\frac{1}{2}$ black; fore and mid tibiae fuscous, hind tibiae dark fuscous; fore tarsi with basal segment fulvous, apical 4 segments fuscous, mid and hind tarsi with basal segments fulvous, apical 4 segments dark fulvous; mid tibiae each with an apical black spur.

Wings length 6.2 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except dark fuscous subcostal cell, narrow dark fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a broad wedge shaped dark fuscous band running from costal band to enclose r-m crossvein, a broad Z-shaped dark fuscous band across wing, a broad dark fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sternum I and II wider than long. Terga I-V black without pale markings. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. ismayi is similar to *B. reclinata* in possessing a large black marking on dorsal surface of scutellum, a black mesonotum and dark fuscous patterns across wing but differs in having a large wedge shaped band covering r-m crossvein and a broad Z-shaped band across the wing.

This species is named after Dr John W. Ismay

who has made an outstanding contribution in collecting Diptera in Papua New Guinea.

Bactrocera (Bactrocera) kirki (Froggatt), n. comb. (Figs 240-242)

Dacus kirki Froggatt, 1910: 871.

Strumeta kirki: Perkins, 1939: 20-1.

Dacus (Strumeta) kirki: Drew, 1974a: 50-3.

MATERIAL EXAMINED

Lectotype ♀, paralectotype ♀; large series of specimens in DPI (see DISTRIBUTION); 12 specimens in BMNH labelled "Tonga, Tongatapu, Veitonga, 28.v.1976, T. Langi, bred from *Terminalia catappa*"; 4 ♂♂ in BMNH from Austral Is. LOCATION OF TYPES: Lectotype in NSW, paralectotype in BMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Widespread in the South Pacific islands: Western Samoa, American Samoa, Tonga, Niue and Tahiti; type locality unknown. NEW RECORD: Austral Is: 4 ♂♂ in BMNH labelled "Austral Is, Tubuai, Mahu, 0-60 m, iii.1977, N.L.H. Krauss".

DIAGNOSIS

Medium sized species; large black facial spots present; humeral calli yellow (anterodorsal margins black); notopleural calli yellow; mesonotum glossy black, mesopleural stripe slightly wider than notopleural callus, lateral and medial postsutural vittae absent, scutellum glossy black with extreme lateral margins yellow; wing with a narrow pale fuscous costal band and narrow fuscous anal streak, a narrow pale fuscous tinge around r-m and dm-cu crossveins, costal cells with extremely pale fuscous tinge and microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdominal terga glossy black except for 2 longitudinal orange-brown bands over terga II-V either side of a broad medial longitudinal glossy black band.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 241). Spicules at distal end of middle segment of medium width with 4-5 broad triangular dentations of uneven length (Fig. 242).

HOST PLANTS

NEW RECORD: *Terminalia catappa* (Combretaceae).

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. kirki was described adequately by Drew

(1974a). It is similar to *B. setinervis* (Malloch) in having lateral and medial postsutural vittae absent, scutellum yellow with a black triangle on dorsal surface and humeral calli yellow but differs in possessing facial spots and yellow notopleural calli.

There is one female in NSW labelled "*Dacus kirki* Froggatt, New Zealand, CO-TYPE" and one female in BMNH labelled "Cotype, *D. kirki*, 1910", "Peaches, Kirk 1904, New Zealand". No holotype was designated by Froggatt (1910) and I designate the female in NSW as lectotype and the female in BMNH paralectotype.

***Bactrocera (Bactrocera) lampabilis*
(Drew), n. comb. (Fig. 243)**

Dacus (Strumeta) lampabilis Drew, 1971: 67–9.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6950) in QM.

DISTRIBUTION

New Britain (type locality, Salelubu) and Lihir I.

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching humeral callus, short lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a triangular shaped glossy black marking on dorsal surface; wing with a broad fuscous costal band and anal streak, a broad transverse fuscous band across centre of wing and a narrower transverse fuscous band across apex, costal cells colourless (second costal cell with outer $\frac{1}{3}$ fuscous), microtrichia covering outer $\frac{1}{3}$ of second costal cell only; all abdominal terga entirely glossy black except for a small dark fulvous area across posterior margin of tergum V.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. lampabilis was described adequately by Drew (1971). It is similar to *B. longicornis* Macquart in possessing 2 distinct transverse fuscous bands across wing, black mesonotum and scutellum yellow with a black triangle on dorsal surface. It differs from this species in having a broad mesopleural stripe extending to humeral callus, neither of the transverse fuscous bands across wing recurved back from the hind margin and lateral postsutural vittae broad and ending at level of sa. bristles.

***Bactrocera (Bactrocera) laticaudus*
(Hardy), n. comb. (Figs 244–246)**

Not *Dacus fuscatus* Wiedemann, 1819: 28.

Strumeta fuscatus Perkins and May, 1949: 5–7; May, 1963:50.

Dacus (Strumeta) laticaudus Hardy, 1950: 87–9, 1951: 159, 1952: 365.

MATERIAL EXAMINED

Two specimens of *S. fuscatus* both labelled holotype: lectotype ♀ (T.5248), Cairns, Queensland, 12.ix.1937, F.A. Perkins, bred from *Sideroxylon obovatum*; paralectotype ♂ (T.5247), Cairns, Queensland, 12.ix.1937, F.A. Perkins, bred from *Sideroxylon obovatum*; remainder of type series of *S. fuscatus* in UQ; a series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: *D. laticaudus*, holotype ♂ in NMNH; *S. fuscatus*, lectotype (T.5248) and 1 paralectotype (T.5247) in QM, 72 paralectotypes in UQ.

DISTRIBUTION

Restricted to coastal rainforests of north Queensland; type locality, near Deeral, Queensland (see Hardy, 1952).

DIAGNOSIS

Small to medium sized species; large oval black facial spots present; humeral and notopleural calli yellow; mesonotum uniformly dark fuscous, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band (almost confluent with R_{4+5}) and a broad fuscous anal streak, costal cells very pale fuscous with microtrichia in outer corner of second costal cell only; abdominal terga III–V dark fuscous to dull black tending fuscous along posterior margin of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.67 times breadth; fulvous with, at most, pale fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with very large oval black spots; length of face 0.5 mm. Genae fulvous, dark fuscous subocular spot present; red-brown bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with 4–7 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum and pleural areas uniformly dark fuscous. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing posteriorly to end at or just before upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow dark fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all coxae dark fuscous; fore femora fulvous with apical 1/2 pale fuscous, mid femora fulvous with apical 1/2 fuscous, hind femora fulvous with apical 1/3 fuscous; fore tibiae pale fuscous tending fulvous apically, mid tibiae fulvous, hind tibiae fuscous; all tarsal segments fulvous except apical 4 segments of fore tarsi pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.1 mm; costal cells very pale fuscous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, narrow fuscous band enclosing r-m crossvein, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown except for a broad transverse dark fuscous band along anterior margin and widening to cover lateral margins; terga III-V dark fuscous to dull black except fuscous along posterior margin of tergum V. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment fuscous, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.58:1. Apex of piercer tapering sharply to a point from line of subapical bristle and with 3 pairs of subapical bristles (Fig. 245). Spicules at distal end of middle segment of medium width with a range from 2 large dentations

up to 6 dentations of variable size (Fig. 246).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. laticaudus is similar to *B. hispidula* (May) in possessing a pale coloured mesonotum, yellow scutellum and infuscation on 1 crossvein but differs from this species in having notopleural calli yellow, mesonotum and abdominal terga mostly dark fuscous, r-m crossvein infuscated and costal cells pale fuscous.

Although *Dacus laticaudus* Hardy is a synonym of *Strumeta fuscatus* Perkins and May, Hardy (1951) noted that the name *fuscatus* was preoccupied in *Dacus* by *D. fuscatus* Wiedemann (1819) and therefore proposed *D. laticaudus* as the available name. A name rejected before 1961 as a secondary homonym cannot be restored and so *laticaudus* is here retained under *Bactrocera* even though *fuscatus* has seniority (see Article 59b of the International Code of Zoological Nomenclature).

Originally, Perkins and May (1949) did not define type specimens, only stating that the species was described from a series of over sixty specimens, bred from fruits of *Sideroxylon obovatum* collected at Cairns in August and September, 1937. The 2 specimens labelled holotype in QM (1 male and 1 female) and 72 in UQ are part of the type series. I designate the female specimen (T.5248 in QM) as lectotype and the remaining 73 specimens paralectotypes.

***Bactrocera (Bactrocera) lineata* (Perkins), n. comb. (Fig. 247)**

Strumeta lineata Perkins, 1939: 16-17.

Dacus (Strumeta) lineatus: Drew, 1974a: 53-5.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); Perkins' type specimens.

LOCATION OF TYPES: Lectotype ♀ and paralectotype ♂ in BMNH.

DISTRIBUTION

Widespread in lowland rainforests of Papua New Guinea (type locality, Kokodo) but does not occur in nearby islands.

DIAGNOSIS

Medium sized species; large black facial spots present; humeral calli fuscous to dark fuscous; notopleural calli yellow; mesonotum shining black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, short narrow lateral postsutural vittae

present, medial postsutural vitta absent, scutellum yellow with a broad black basal band; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless, microtrichia covering most of second costal cell and outer corner of first costal cell; abdominal terga mostly black except tending red-brown along posterior margin of tergum V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. lineata was described adequately by Drew (1974a). It is similar to species in the *anthracina* and *nigella* complexes in possessing a black mesonotum with lateral postsutural vittae, abdominal terga mostly black, wings colourless with costal band and anal streak but differs in having black humeral calli.

Originally, Perkins (1939) did not designate a holotype. The species was described from one male and one female and both have printed holotype labels. I have studied these specimens and designate the female as lectotype and the male paralectotype.

***Bactrocera (Bactrocera) longicornis* Macquart** (Fig. 248)

Bactrocera longicornis Macquart, 1835: 452-3.

Dacus (Bactrocera) longicornis: Hardy, 1976: 245-9.

Dacus (Strumeta) denigratus Drew, 1971: 61-3; Hardy, 1976: 246 (syn.).

MATERIAL EXAMINED

A large series of specimens (including 1 paratype of *D. denigratus*) in DPI (see DISTRIBUTION).

LOCATION OF TYPES: *B. longicornis*, holotype ♂ in MNHN; *D. denigratus*, holotype ♂ (T.6946) in QM.

DISTRIBUTION

Known from New Ireland, Lihir I. and Bougainville I.; type locality, Gagi I. (Solomon Islands).

DIAGNOSIS

Medium sized species; large oval facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a black triangular marking on dorsal surface; wing with a broad fuscous costal band and anal streak, a broad fuscous recurved band across centre of wing and a narrow fuscous band across apex, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga

mostly black except orange-brown across posterior margin of tergum V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. longicornis was described adequately by Drew (1971) as *Dacus denigratus*. This species is similar to *B. lampabilis* (Drew) in possessing 2 transverse fuscous bands across the wing, black mesonotum and a large black triangle on dorsal surface of scutellum but differs in having the mesopleural stripe not extending to humeral callus, the transverse fuscous band across centre of wing recurved back along M_{3+4} and the lateral postsutural vittae narrow and ending before the upper pa. bristles.

Bactrocera (Bactrocera) luteola (Malloch), n. comb. (Fig. 249)

Dacus luteola Malloch, 1931: 262.

Dacus incertus Malloch, 1938: 113-5; Drew, 1974a: 55 (syn.).

Dacus (Strumeta) luteolus: Drew, 1974a: 55-7.

MATERIAL EXAMINED

Holotype ♂ of *D. luteolus* and paratype ♂ of *D. incertus*.

LOCATION OF TYPES: *D. luteolus*, holotype ♂ in BMNH; *D. incertus*, holotype ♂, 4 ♀ and 3 ♂ paratypes in BPBM; 4 paratypes in NMNH.

DISTRIBUTION

Known from Bora Bora I., Society Is (type locality) and Hao I. (Tuamotu Archipelago).

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow; notopleural calli shining orange-brown; mesonotum shining orange-brown without dark markings, mesopleural stripe reaching to humeral callus, lateral and medial postsutural vittae absent, scutellum yellow with a broad orange-brown basal band; wing with a narrow fuscous costal band, anal streak absent, pale infuscation around r-m and dm-cu crossveins, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III-V shining orange-brown with oval fuscous spots on anterolateral corners of tergum III and small circular fuscous spots centrally on anterior margins of terga IV and V. ATTRACTANT: No known record.

COMMENTS

B. luteola was described adequately by Drew (1974a). It is similar to *B. mendosa* in possessing a red-brown mesonotum, yellow humeral calli, lateral and medial postsutural vittae absent but

differs from this species in having costal cells colourless, notopleural calli shining orange-brown, mesopleural stripe reaching humeral callus, scutellum entirely yellow, triangular yellow marking along mesonotal suture absent.

***Bactrocera (Bactrocera) melanogaster*, n. sp.**
(Fig. 250)

TYPE SPECIMENS

Holotype ♂, SOLOMON IS: Lunga, Guadalcanal I., attracted to methyl eugenol, 15.i.1970, J.H. Stapley.

Paratype, BOUGAINVILLE I.: 1 ♂, Buin, Dec. 1971, N.L.H. Krauss.

LOCATION OF TYPES: Holotype (T.10553) in QM; paratype in DPI.

DISTRIBUTION

Known from Bougainville I. and the Solomon Islands.

DIAGNOSIS

Medium sized species; very large oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, medium sized mesopleural stripe reaching just anterior to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and broad fuscous anal streak; abdominal terga I–V dark shining black except for orange-brown margins posterolaterally on tergum II.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.55 mm. Frons narrowing slightly posteriorly, length 1.67 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered with a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with very large oval black facial spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with 5–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a strong black dorsal bristle on segment 2; length of segments: 0.23 mm; 0.29 mm.

Thorax mesonotum and pleural areas shining black without pale markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, extending just anterior to anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli

(remainder black); 2 narrow lateral postsutural vittae narrowing sharply posteriorly to end just behind sa. bristles. Postnotum black. Scutellum yellow except for a broad black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae black; apical $\frac{1}{2}$ of fore and hind femora and apical $\frac{2}{3}$ of mid femora black (remainder fulvous); fore tibiae pale fuscous, mid tibiae fuscous, hind tibiae dark fuscous; all tarsal segments fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.1 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, pale fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous band enclosing r–m crossvein, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A_1 + CuA_2 ; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V shining black except for 2 broad transverse dark orange-brown bands posterolaterally on tergum II. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. melanogaster is similar to *B. neonigrita* in possessing colourless costal cells, abdominal terga III–V mostly black, mesonotum black, scutellum entirely yellow and infuscation on 1 crossvein but differs from this species in having short lateral postsutural vittae narrowing to end well before upper pa. bristles.

Bactrocera (Bactrocera) melanotus
(Coquillett), n. comb. (Figs 251–253)

Dacus melanotus Coquillett, 1910: 13.

Dacus rorotonga Froggatt, 1910: 872; Perkins, 1939: 11 (syn.).

Chaetodacus melanotus: Bezzi, 1928: 104–5.

Strumeta melanotus: Perkins, 1939: 11.

Dacus (Strumeta) melanotus: Drew, 1974a: 57–9.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); 2 of Coquillett's types.

LOCATION OF TYPES: *D. melanotus*, lectotype ♂, 1 ♂ and 1 ♀ paralectotype in NMNH; *D. rorotonga*, unknown.

DISTRIBUTION

Restricted to the Cook Is (type locality).

DIAGNOSIS

Medium sized species; facial spots absent or small and pale; humeral calli yellow (anterolateral corners black); notopleural calli glossy black; mesonotum glossy black, mesopleural stripe reaching to humeral callus, lateral and medial postsutural vittae absent, scutellum glossy black; wing with a narrow pale fuscous costal band and narrow fuscous tint in anal cell, narrow pale fuscous markings along r-m and dm-cu crossveins, costal cells colourless or with a very pale fuscous tint, microtrichia in outer corner of second costal cell only; all abdominal terga entirely glossy black.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 252). Spicules at distal end of middle segment of medium width with 6-10 triangular dentations of uneven length (Fig. 253). **ATTRACTANT:** Cue lure. Earlier records of attraction to methyl eugenol (Drew 1974a, 1974b) are incorrect (Bateman 1985).

COMMENTS

B. melanotus was described adequately by Drew (1974a). It is similar to *B. atra* (Malloch) and *B. perfusca* (Aubertin) in possessing an entirely black scutellum, mesonotum black with medial and lateral postsutural vittae absent, abdominal terga black but differs from these species in having infuscation around r-m and dm-cu crossveins. In addition, it can be separated from *B. atra* in having humeral calli mostly yellow, yellow mesopleural stripe and black femora.

In the original description, Coquillett listed the material studied as follows. "Two males and one female bred from oranges. Type No. 12739, U.S. National Museum". Confusion surrounds the Coquillett types with regard to holotype designation (see note under *B. facialis*). I have received 2 specimens for study and designate the male labelled "Type No. 12739 USNM" by Coquillett as lectotype and the remaining specimens as paralectotypes.

Bactrocera (Bactrocera) mendosa

(May), n. comb. (Figs 254-256)

Strumeta mendosa May, 1957b: 303-4; May, 1963: 50.

MATERIAL EXAMINED

Holotype ♀, Atherton, Queensland, 18.vi.1956, A.W.S.

May; a series of specimens bred from *Pouteria sericea*, 30 km N of Mataranka, Northern Territory, 26.v.1976, A. Allwood.

LOCATION OF TYPE: Holotype (T.5594) in QM.

DISTRIBUTION

Known only from Mataranka (Northern Territory) and Atherton, Queensland (type locality), associated with endemic forest areas.

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow with a fuscous spot on apex; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous with microtrichia covering second costal cell and outer 1/2 of first costal cell; abdominal terga III-V orange-brown except for a broad transverse red-brown band across anterior 1/3 of tergum III which widens on lateral margins of that tergum.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.74 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump; latter covered by large number of short dark setae; orbital bristles black: 1 s.or., 2-3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots; length of face 0.55 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4-7 well developed black bristles. Antennae with all segments fulvous; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.16 mm; 0.30 mm; 0.85 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a very small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); a small triangular marking above notopleural calli and extending approximately halfway along mesonotal suture. Lateral and medial postsutural vittae absent. Postnotum red-brown. Scutellum yellow with

narrow red-brown basal band and pale fuscous spot on apex. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 5.2 mm; costal cells fuscous; microtrichia covering second costal cell and outer $\frac{1}{2}$ of first costal cell; remainder of wings with a pale fuscous tint except fuscous subcostal cell, narrow fuscous costal band overlapping R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I red-brown; tergum II fulvous except for a broad transverse red-brown band across anterior $\frac{2}{3}$ and widening to cover lateral margins; terga III–V orange-brown except for a broad transverse red-brown band across anterior $\frac{1}{3}$ of tergum III and widening on lateral margins of that tergum. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.75:1. Apex of piercer dorsoventrally flattened, needle shaped with a row of minute serrations along each side; 3 pairs of small subapical bristles present (Fig. 255). Spicules at distal end of middle segment of medium width with 5–9 triangular dentations of uneven length (Fig. 256).

ATTRACTANT: No known record.

COMMENTS

Originally, May (1957b) placed *B. mendosa* provisionally in *Strumeta* (= *Bactrocera*) because of the absence of postsutural vittae and, as a male specimen was unavailable, it was not known if the third abdominal tergum was ciliated. However, there is a large number of *Bactrocera* that lack postsutural vittae. *B. mendosa* is similar to *B. luteola* (Malloch) in possessing a red-brown mesonotum, yellow humeral calli and scutellum mostly yellow. It differs from this species in having

fuscous costal cells, yellow notopleural calli, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow with a fuscous spot on apex and a yellow triangle along anterior margin of mesonotal suture above notopleural callus.

Bactrocera (Bactrocera) moluccensis (Perkins), n. comb. (Figs 257–259)

Strumeta moluccensis Perkins, 1939: 17–18

Dacus (Strumeta) moluccensis: Hardy, 1970: 120–2; Drew, 1974a: 60–3.

MATERIAL EXAMINED

Holotype ♂, Buru I., Moluccas, Indonesia, 1904, H. Rolle; a large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Widespread throughout Papua New Guinea and from the following islands: Buru (type locality), New Britain, New Ireland, Lihir and Bougainville.

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V fulvous with a narrow black transverse band along anterior margin of tergum III and a narrow medial longitudinal fuscous to black band over all 3 terga.

DESCRIPTION

FEMALE: Ovipositor apex of piercer with a pair of small subapical keels, 4 pairs of subapical bristles (2 large and 2 small) (Fig. 258). Spicules at distal end of middle segment wide with 13–19 dentations of markedly uneven length (Fig. 259). **ATTRACTANT:** Cue lure, Willison's lure.

COMMENTS

B. moluccensis was described adequately by Drew (1974a). It is similar to species in the *bidentata* complex and *B. robiginosa* (May) in possessing pale fulvous costal cells without dense microtrichia, abdominal terga III–V pale and lacking lateral dark colour patterns, a medial longitudinal dark band on some abdominal terga and mesonotum pale (red-brown or orange-brown).

It differs from these species in having abdominal terga III–V with a narrow transverse black band across base of tergum III and a medial longitudinal fuscous to black band on all 3 terga. *B. turneri* is a very similar species in general size and body colour patterns but differs in the shape of the apex of the piercer and spicules of the ovipositor.

Hardy (1983) disagreed with Drew (1974a) synonymising *Strumeta rutila* Hering and *B. moluccensis*. I have received on loan the female paratype of *S. rutila* and agree with Hardy that this is a smaller specimen than the average for *B. moluccensis*. It also differs from *B. moluccensis* in possessing 2 pairs of strong subapical keels on the apex of the piercer of the ovipositor. The holotype of *S. rutila*, also examined, has the ovipositor concealed.

***Bactrocera (Bactrocera) morula*, n. sp.**
(Fig. 260)

TYPE SPECIMEN

Holotype ♂, SOLOMON IS: Guadalcanal I., Honiara, December 1971, N.L.H. Krauss.

LOCATION OF TYPE: Holotype (T.10554) in QM.

DISTRIBUTION

Known only from Honiara (Solomon Islands).

DIAGNOSIS

Medium sized species; face black; humeral calli glossy black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe of medium width reaching almost to anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow except for a broad medial longitudinal glossy black band enclosing sc. bristles; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga I–V glossy black except for a narrow transverse dark fuscous band across posterior margin of tergum V and extending anteriorly along either side of a medial longitudinal black band.

DESCRIPTION

MALE: Head generally dark. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.67 times breadth; fulvous with dark fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex dark fuscous. Face glossy black, length of face 0.45 mm. Genae fuscous, black subocular spot present; black bristle present. Occiput black, fulvous along eye

margins; occipital row with 4–6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segment: 0.18 mm; 0.28 mm; 0.80 mm.

Thorax mesonotum and pleural areas glossy black. Yellow markings as follows: notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin straight; upper hypopleural calli (posterior apices glossy black); a small triangle on dorsomedial section of lower hypopleural calli (remainder glossy black). Humeral calli glossy black. Lateral and medial postsutural vittae absent. Postnotum black. Scutellum yellow except for a broad medial longitudinal glossy black band enclosing sc. bristles. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae black; all femora glossy black except hind femora tending paler basally; fore and mid tibiae dark fuscous, hind tibiae black; all tarsal segments fulvous; rows of long black setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.8 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga glossy black except for a narrow transverse dark fuscous band across posterior margin of tergum V and extending anteriorly along either side of a medial longitudinal black band. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. morula is similar to *B. kirki* (Froggatt) and *B. setinervis* (Malloch) in possessing a broad black triangular marking on dorsal surface of scutellum, mesonotum black with lateral and medial postsutural vittae absent and wings colourless except for costal band and anal streak but differs

in having humeral calli black and abdominal terga uniformly black without paler markings.

***Bactrocera (Bactrocera) mucronis*
(Drew), n. comb. (Fig. 261)**

Dacus (Strumeta) mucronis Drew, 1971: 70–1.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6951) in QM.

DISTRIBUTION

Known from Noumea (type locality) and Sarramea in New Caledonia.

DIAGNOSIS

Small species; facial spots absent; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, short lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for broad lateral longitudinal fuscous to black bands over all 3 terga.

ATTRACTANT: Cue lure.

COMMENTS

B. mucronis was described adequately by Drew (1971). It is similar to *B. facialis* (Coquillett) in possessing short lateral postsutural vittae, black mesonotum with medial postsutural vitta absent, scutellum yellow and wings colourless except for costal band and anal streak. It differs from this species in having 2 broad lateral longitudinal black bands on abdominal terga III–V and lateral postsutural vittae ending behind level of sa. bristles.

***Bactrocera (Bactrocera) mutabilis*
(May), n. comb. (Figs 262–264)**

Strumeta mutabilis May, 1951: 6–8.

Dacus (Bactrocera) mutabilis: Drew, 1982: 38–40.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.5265) in QM.

DISTRIBUTION

Known from south-east and northern Queensland and appears to be confined to higher altitudes; type locality, Toowoomba.

DIAGNOSIS

Medium sized species; facial spots absent; humeral and notopleural calli yellow; mesonotum red-brown with oval black spots on anterior margin, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia covering second costal cell and most of first costal cell; all abdominal terga entirely orange-brown.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 3 pairs of subapical bristles (Fig. 263). Spicules at distal end of middle segment of medium width with 9–15 small dentations of approximately even length (Fig. 264).

ATTRACTANT: No known record.

COMMENTS

B. mutabilis was described adequately by Drew (1982). It is similar to species in the *tryoni* complex, *B. humilis* (Drew and Hancock) and *B. unipunctata* (Malloch) in possessing dense microtrichia covering most of the costal cells, pale mesonotum (orange-brown or red-brown), scutellum yellow and wings colourless except for costal band and anal streak but differs in having facial spots absent and abdominal terga uniformly yellow-brown.

***Bactrocera (Bactrocera) neocheesmanae*, n. sp.
(Fig. 265)**

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western Highlands Province: Mt Hagen, attracted to methyl eugenol, 24.ii.1981, B. Thistleton.

Paratypes, PAPUA NEW GUINEA, Western Highlands Province: Mt Hagen, 1 ♂ 2.xii.1980, 1 ♂ 10.xii.1980, 1 ♂ 13.i.1980, B. Thistleton. Central District: 4 ♂♂, Bakoiudu (500 m), 21.i.1969, T.L. Fenner; 1 ♂, Bisianumu, Sogeri, 25.vi.1980, R.A.I. Drew and D.W. Currey; 5 ♂♂, Ningerum Garden, 28.vi.1984–10.vii.1984, K. Hortle. All paratypes attracted to methyl eugenol.

LOCATION OF TYPES: Holotype (T.10555) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 9 paratypes in DPI.

DISTRIBUTION

Known from the Western Highlands Province and Central District, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized elongate

oval black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe broad extending to humeral callus, lateral and medial postsutural vittae present, scutellum yellow; legs fulvous except hind tibiae pale fuscous basally; wing with a broad fuscous costal band and anal streak, a broad transverse fuscous band across wing enclosing both crossveins, costal cells pale fuscous, microtrichia covering second costal cell and most of first costal cell; abdominal terga III–V orange-brown except for anterolateral corners of tergum III pale fuscous to fuscous and very narrow pale fuscous to fuscous margins laterally on all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.42 times breadth; fulvous with or without pale fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of small pale setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized elongate-oval black spots; length of face 0.48 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 6–8 well developed pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.25 mm; 0.73 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae and between humeral and notopleural calli. Pleural areas dark fuscous to black except red-brown above mid coxae and below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching humeral callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width and narrowing slightly posteriorly to end before upper pa. bristles; a broad medial longitudinal vitta beginning posterior to prsc. bristles and narrowing to a point at level of mesonotal suture. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except hind tibiae pale fuscous basally; rows of long pale setae

on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.2 mm; costal cells pale fuscous; microtrichia covering second costal cell and most of first costal cell; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with but slightly paler above R_{4+5} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin, a broad transverse fuscous band across centre of wing and enclosing both crossveins; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I wider than long. Sterna I and II slightly wider than long. Tergum I dark fuscous; tergum II orange-brown except for a broad transverse dark fuscous band across anterior $\frac{1}{2}$ but not reaching lateral margins; terga III–V orange-brown except for pale fuscous to fuscous anterolateral corners on tergum III and very narrow pale fuscous margins on terga III–V. A pair of orange-brown shining spots of unusual shape, in the form of narrow transverse lines. Posterior lobe of surstylus short, sternum V with a moderately deep concavity on posterior margin. ATTRACTANT: Methyl eugenol.

COMMENTS

B. neocheesmanae is similar to *B. cheesmanae* (Perkins) in possessing lateral and medial postsutural vittae, a single transverse fuscous band across the wing, costal cells pale fuscous with microtrichia covering first costal cell and mesonotum mostly fuscous or black. It differs from this species in having mesonotum mostly black and abdominal terga III–V orange-brown with at most narrow fuscous lateral margins.

***Bactrocera (Bactrocera) neonigrita*, n. nom.** (Fig. 266)

Not *Dacus (Afrodacus) aberrans nigritus* Hardy, 1955a: 5.
Dacus (Strumeta) nigritus Drew, 1971: 75–7.

MATERIAL EXAMINED

A large series of paratypes in DPI.
LOCATION OF TYPE: Holotype ♂ (T.6955) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Widespread throughout New Britain (type locality, Keravat), New Ireland and Bougainville I.

NEW RECORD: Solomon Islands: 2 ♂♂, Korovou, attracted to methyl eugenol, 12.x.1984, E. Holoie.

DIAGNOSIS

Small species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent; scutellum yellow; wing with a narrow fulvous costal band and broad pale fuscous anal streak, broad infuscation along r-m crossvein which continues as a pale diffuse pattern across remainder of wing, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III and IV black and tergum V fuscous except dark fulvous along posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. neonigrita was described adequately by Drew (1971). It is similar to *B. melanogaster* in possessing abdominal terga III-V mostly black, costal cells colourless, mesonotum black, scutellum entirely yellow and infuscation on r-m crossvein but differs in having broad lateral postsutural vittae reaching upper pa. bristles. The name *Dacus nigrinus* Drew is preoccupied in *Dacus* by *D. aberrans nigrinus* Hardy and must be treated as a primary homonym even though it is now transferred to *Bactrocera* (see Articles 57(a) and 57(b) of the International Code of Zoological Nomenclature).

Bactrocera (Bactrocera) obliqua
(Malloch), n. comb. (Figs 267-269)

Dacus obliquus Malloch, 1939a: 238-40.

Dacus (Strumeta) obliquus: Drew, 1974a: 67-9.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♀ in BMNH.

DISTRIBUTION

Known from New Britain, Bougainville I. and Admiralty Is (type locality).

DIAGNOSIS

Medium sized species; face black; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, short lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad medial longitudinal black band; wing with a narrow fuscous costal band and anal streak, r-m crossvein very oblique, a pale infuscation along r-m crossvein which becomes diffuse as it continues along wing, costal cells colourless with

microtrichia in outer corner of second costal cell only; all abdominal terga entirely black.

DESCRIPTION

FEMALE: Ovipositor apex of piercer tapering sharply to a point from line of subapical bristles, with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 268). Spicules at distal end of middle segment of medium width with 5-9 small dentations of approximately even length (Fig. 269).

ATTRACTANT: No known record.

COMMENTS

B. obliqua was described adequately by Drew (1974a). It is similar to *B. psidii* (Froggatt) in possessing a broad black triangular marking on dorsal surface of scutellum, infuscation on crossveins and mesonotum black with medial postsutural vitta absent but differs in having a black face, r-m crossvein longer than dm-cu crossvein, lateral postsutural vittae very short and narrow ending just behind sa. bristles, legs with all tibiae and apices of femora and apical 4 segments of tarsi fuscous.

Bactrocera (Bactrocera) obscura
(Malloch), n. comb. (Fig. 270)

Dacus obscurus Malloch, 1931: 264.

Strumeta obscurus: Perkins, 1939: 6.

Dacus (Strumeta) obscurus: Drew, 1974a: 69-71.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); 5 ♂♂ in DPI, Niuauputapu I., Tonga, 25.ix.1973, O. Fakalata; 1 ♂ paratype (No. 43667), Samoa, R.W.Doane. LOCATION OF TYPES: Holotype ♂ in BMNH, paratype ♂ in NMNH.

DISTRIBUTION

Known from Western Samoa (type locality, Upolu), Eastern Samoa and Tonga.

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow with pale fuscous on apex; wing with a narrow fuscous costal band and broad fuscous anal streak, a very pale fuscous tint across central area of wing membrane, costal cells extremely pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown with a medial longitudinal dark band and a pair of

anterolateral dark spots on each tergum, the dark patterns on the abdomen vary from fuscous to black.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. obscura was described adequately by Drew (1974a). It is similar to *B. allwoodi* (Drew) in possessing abdominal terga orange-brown with dark markings, mesonotum black and lacking lateral and medial postsutural vittae, humeral calli yellow and wings colourless except for costal band and anal streak. It differs from this species in having a fuscous spot on apex of scutellum, costal cells extremely pale fulvous and abdominal terga III–V orange-brown with a pair of transverse dark fuscous spots on each tergum and a narrow medial longitudinal band which is fuscous to dark fuscous on terga III and IV and black on tergum V.

Bactrocera (Bactrocera) ochromarginis (Drew), n. comb. (Fig. 271)

Dacus (Asiadacus) ochromarginis Drew, 1971: 40–2.

Dacus (Strumeta) ochromarginis: Drew, 1972a: 21.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6933) in QM.

DISTRIBUTION

New Britain (type locality, Vudal, near Keravat).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, a broad yellow band connecting humeral and notopleural calli, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless to extremely pale fulvous with microtrichia in outer corner of second costal cell only; all abdominal terga orange-brown except for a medial elongate black spot on tergum V.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. ochromarginis was described adequately by Drew (1971). It is similar to *B. diaphana* (Hering) in possessing humeral and notopleural calli joined by a lateral yellow band, a narrow costal band not extending to R_{4+5} , mesonotum red-brown with lateral postsutural vittae present and medial

postsutural vitta absent. It differs from this species in having the mesopleural stripe extending to humeral callus above, notopleural calli entirely yellow, lateral postsutural vittae beginning at mesonotal suture and microtrichia in outer corner of second costal cell only.

Bactrocera (Bactrocera) passiflorae (Froggatt), n. comb. (Figs 272–274)

Dacus passiflorae Froggatt, 1910: 870.

Chaetodacus passiflorae: Bezzi, 1928: 106–7.

Strumeta passiflorae: Perkins, 1939: 8.

Dacus (Strumeta) passiflorae: Drew, 1974a: 71–4.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); lectotype ♂ and 2 ♂ paralectotypes.

LOCATION OF TYPES: Lectotype and 2 paralectotypes in NSW.

DISTRIBUTION

Known from Fiji (type locality) and Niue I.

DIAGNOSIS

Small species; facial spots absent; humeral calli glossy black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to or beyond anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow; wing with a narrow fuscous costal band and narrow pale fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga I–IV glossy black and tergum V either glossy black with posterior margin dark fuscous or fuscous with a medial longitudinal black band.

DESCRIPTION

FEMALE: Ovipositor apex of piercer rounded at tip with 4 pairs of subapical bristles (Fig. 273). Spicules at distal end of middle segment of medium width with 7–12 dentations of uneven length (Fig. 274).

ATTRACTANT: Cue lure.

COMMENTS

B. passiflorae was described adequately by Drew (1974a). It is similar to *B. thistletoni* in possessing black humeral calli, scutellum entirely yellow, mesonotum black with lateral and medial postsutural vittae absent but differs in having facial spots absent and legs entirely fulvous.

In NSW there is one male labelled "Fruit Fly, Granadila, Fiji, Butler, Bred 15/6/99" and "*D. passiflorae*, Cotype, WWF, 1910", the latter label being in Froggatt's handwriting; two males on 1

pin labelled "On Guava, Fiji, 11.12.99, Mr Koeboele" and "CO-TYPE SPECIES". Froggatt did not designate types and the label data do not match exactly the collector/host information given in the original description. However, these specimens are probably part of the type series and I designate the single male as lectotype and the two males on 1 pin paralectotypes.

***Bactrocera (Bactrocera) penefurva*, n. sp.**
(Fig. 275)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central Province: 20 km SE Port Moresby, hand collected on bushes, 26.i.1985, J.W. Ismay.

Paratype, SOLOMON IS: 1 ♂, Tenaru, Guadalcanal I., in Malaise trap, April 1984, R. MacFarlane.

LOCATION OF TYPES: Holotype (T.10556) in QM; 1 paratype in BMNH.

DISTRIBUTION

Known from the Central Province, Papua New Guinea and Tenaru, Guadalcanal I. (Solomon Islands).

DIAGNOSIS

Very small species; facial spots absent; humeral calli yellow; notopleural calli with anterior $\frac{1}{2}$ black, posterior $\frac{1}{2}$ fulvous; mesonotum black, mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae present, scutellum yellow with anterolateral corners black; legs entirely fulvous; wing without a distinct costal band and anal streak but with a large fuscous spot in apex, a large bulla on anal cell extension, costal cells fuscous with dense microtrichia covering second costal cell and outer corner of first costal cell; abdominal terga mostly orange-brown except for small irregular black spots on lateral margins of terga III, IV and V and a broad medial longitudinal black band on posterior $\frac{3}{4}$ of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.1 mm. Frons widening slightly posteriorly, length 1.5 times breadth; dark fulvous except dark fuscous anteriorly and fuscous around s.or. bristles; anteromedial hump absent; orbital bristles black: 1 s.or., 1 i.or.; lunule fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous without facial spots and with a small area of pale fuscous dorsally; length of face 0.4 mm. Genae fulvous, subocular spot absent; large red-brown bristle present. Occiput black dorsally, fulvous ventrally, yellow along eye margins; no distinct occipital row present. Antennae with segment 1 fulvous,

segments 2 and 3 entirely dark fuscous; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.08 mm; 0.15 mm; 0.45 mm.

Thorax mesonotum and pleural areas black. Yellow markings as follows: humeral calli; broad mesopleural stripe reaching humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior 5/9 lower hypopleural calli (remainder black); 2 moderately broad parallel sided lateral postsutural vittae ending behind upper pa. bristles; a very broad medial postsutural vitta rounded posteriorly and beginning at posterior margin of mesonotum and narrowing to a point anteriorly to end at level of mesonotal suture. Notopleural calli black on anterior $\frac{1}{2}$ and fulvous on posterior $\frac{1}{2}$. Postnotum black. Scutellum yellow except for anterolateral corners black. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 3; all bristles well developed and fuscous.

Legs all segments entirely fulvous except for a narrow black line along ventral surface of mid femora; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.2 mm; costal cells fuscous; dense microtrichia covering second costal cell and outer corner of first costal cell; remainder of wings colourless except for a large fuscous spot covering apex of wing; there is no distinct costal band and the anal streak is absent; a large bulla covering anal cell extension; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe very strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All abdominal terga uniformly orange-brown except anterolateral corners of tergum I black, irregular black spots on lateral margins of terga III, IV and V and a broad medial longitudinal black stripe on posterior $\frac{3}{4}$ of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. penefurva is similar to *B. tigrina* (May) from north Queensland and is a good example of speciation between 2 geographically close land masses. The 2 species are similar in the unique male wing and body colour patterns. *B. penefurva* differs in having sa. bristles, the medial postsutural vitta longer and narrower and in lacking black

posterodorsal corners on the humeral calli of males.

Bactrocera (Bactrocera) pepisalae
(Froggatt), n. comb. (Fig. 276)

Dacus pepisalae Froggatt, 1910: 869–70; Malloch, 1939a: 242–3.

Dacus (*Neodacus*) *pepisalae*: Hardy, 1954: 11–12.

Dacus (*Strumeta*) *pepisalae*: Drew, 1974a: 74–5.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Unknown.

DISTRIBUTION

Known from the following islands: Florida, Guadalcanal, San Cristobal (Solomon Islands) and Bougainville; type locality, Russell I. (Solomon Islands).

DIAGNOSIS

Large species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing membrane generally fuscous, costal cells dark fulvous with microtrichia in outer ½ of second costal cell only; abdominal terga III–V black.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. pepisalae was described adequately by Drew (1974a). It is similar to *B. amplexiseta* (May) and *B. ebenea* (Drew) in having a large area of the wing membrane covered with diffuse fuscous colouration, and similar to *B. amplexiseta* in possessing facial spots and lateral postsutural vittae. It differs from *B. amplexiseta* in having a black mesonotum, infuscation covering the entire wing membrane and abdominal terga III–V uniformly black and differs from *B. ebenea* in having facial spots and lateral postsutural vittae.

Bactrocera (Bactrocera) perfusca
(Aubertin), n. comb. (Fig. 277)

Chaetodacus perfuscus Aubertin, 1929: 173–4.

Dacus (*Marquesadacus*) *perfuscus*: Malloch, 1932: 145–6.

Strumeta perfuscus: Perkins, 1939: 6.

Dacus (*Strumeta*) *perfuscus*: Drew, 1974a: 75–6.

MATERIAL EXAMINED

One ♀ labelled "Type", "Marquesas Is., Nuka Hiva, L.E. Cheesman" and 1 ♂ labelled "Type", "Marquesas Is., Hiva-oa, L.E. Cheesman"; 1 ♀ labelled "Paratype", "Marquesas

Is., Hiva-oa, L.E. Cheesman" and 1 ♂ labelled "Paratype", "Marquesas Is., Tahuata, L.E. Cheesman".

LOCATION OF TYPES: Holotype ♂ and 16 paratypes in BMNH.

DISTRIBUTION

Hiva-oa, Marquesas Is (type locality).

DIAGNOSIS

Medium sized species; facial spots absent; humeral and notopleural calli glossy black; mesonotum entirely glossy black, mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae absent, scutellum glossy black; wing with a narrow fuscous costal band and very pale anal streak, costal cells colourless with microtrichia in outer corner of second cell only; abdominal terga entirely glossy black.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.95 times breadth, fulvous without dark markings; anteromedial hump covered by a small number of pale setae; orbital bristles black: 1 s.or., 1 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark spots; length of face 0.48 mm. Genae fulvous, subocular spot absent; black bristle present. Occiput glossy black dorsally, fulvous ventrally; occipital row with 4–6 strong black bristles. Antennae with all segments fuscous; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.33 mm; 0.80 mm.

Thorax mesonotum and pleural areas glossy black without pale markings. Yellow markings as follows: broad mesopleural stripe reaching humeral callus dorsally, not continuing to sternopleuron, anterior margin straight; anterior 5/8 lower hypopleural calli (remainder glossy black). Humeral and notopleural calli glossy black. Upper hypopleural calli glossy black. Lateral and medial postsutural vittae absent. Postnotum glossy black. Scutellum glossy black. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae dark fuscous; fore femora fulvous, mid and hind femora glossy black; all tibiae and tarsi dark fuscous; mid tibiae each with an apical black spur.

Wings length 7.0 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R₂₊₃ and widening slightly in apex

of wing to end at extremity of M, anal streak reduced to a very pale fuscous tint in cell cup; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. All terga glossy black. A pair of oval glossy black shining spots on tergum V. Basal segment of ovipositor glossy black, conical in transverse cross section and tapering posteriorly in dorsal view. Apex of piercer needle shaped.

MALE: As for female except a dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development; pecten present on abdominal tergum III; posterior lobe of surstylus short; abdominal sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

Previously, types or other specimens of this species could not be located for study (Drew 1974a). *B. perfusca* is similar to *B. melanotus* (Coquillett) in general body and wing colour patterns but differs in possessing the humeral and upper hypopleural calli entirely glossy black, fore femora fulvous and in lacking fuscous colouration around the wing crossveins.

In BMNH there are 17 specimens that are part of the type series. Two specimens, a male and female, are each labelled type and the remainder paratype. Originally, Aubertin (1929) designated the male from Hiva-oa as the holotype and the female from Nuka-Hiva as the allotype. The label data of all 17 specimens conform with that in the description and the male type can be regarded as the holotype and the remaining specimens paratypes.

Bactrocera (Bactrocera) perkinsi

(Drew and Hancock), n. comb. (Fig. 278)

Dacus (Bactrocera) perkinsi Drew and Hancock, 1981: 72–5.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8284) in QM.

DISTRIBUTION

Restricted to the northern area of Cape York Peninsula, Queensland (type locality, Lockerbie) and the Torres Strait islands: Horn and Moa (Banks).

DIAGNOSIS

Medium sized species; medium sized black facial

spots present; humeral and notopleural calli yellow; mesonotum red-brown with or without fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown with a narrow dark band along base of tergum III and a medial longitudinal dark band over all 3 terga and lateral longitudinal dark bands running from posterior area of tergum III to tergum V.

ATTRACTANT: Cue lure.

COMMENTS

B. perkinsi was described adequately by Drew and Hancock (1981). It is similar to species in the *quadrata* complex in possessing colourless wings except for costal band and anal streak, red-brown mesonotum, microtrichia confined to outer corner of second costal cell only, abdominal terga III–V with a medial longitudinal band and narrow lateral dark colour patterns on at least some terga but differs in having a pair of fuscous to black shining spots on tergum V.

Bactrocera (Bactrocera) phaea

(Drew), n. comb. (Fig. 279)

Dacus (Strumeta) phaea Drew, 1971: 77–9.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6956) in QM.

DISTRIBUTION

New Britain (type locality, Keravat) and Lihir I.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching to humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, broad infuscation along r–m crossvein, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a black transverse band across base of tergum III, a medial longitudinal black band over all 3 terga and lateral margins of tergum III and anterolateral corners of tergum IV black.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. phaea was described adequately by Drew (1971). It is similar to *B. curvipennis* (Froggatt) in possessing infuscation on one crossvein, scutellum entirely yellow, mesonotum black, costal cells coloured, legs mostly fulvous and abdominal terga III–V with ground colour orange-brown. It differs from this species in having the mesopleural stripe reaching the humeral callus, microtrichia in outer corner of second costal cell only, legs entirely fulvous, abdominal terga III–V with a broad black medial longitudinal band, a black band across anterior margin of tergum III expanding to cover lateral margins of this tergum and anterolateral corners of tergum IV.

Bactrocera (Bactrocera) phaleriae
(May), n. comb. (Fig. 280)

Strumeta phaleriae May, 1955: 158–60; May, 1963: 50.

MATERIAL EXAMINED

Seven paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.5315) in QM.

DISTRIBUTION

Port Douglas, Queensland (type locality).

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow; notopleural calli red-brown; mesonotum red-brown, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum red-brown with anterolateral corners yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia covering second costal cell and outer corner of first costal cell; abdominal terga I–V orange-brown except for a medial longitudinal fuscous to dark fuscous spot on posterior ½ of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons narrowing slightly posteriorly, length 1.52 times breadth, fulvous with pale fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous without dark spots; length of face 0.45 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 3–6 red-brown bristles.

Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.23 mm; 0.65 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; medium sized mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); 2 narrow parallel sided lateral postsutural vittae ending before upper pa. bristles. Notopleural calli red-brown. Postnotum red-brown. Scutellum red-brown except anterolateral corners yellow. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 2 or 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 5.5 mm; costal cells fulvous; microtrichia covering second costal cell and outer corner of first costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V orange-brown except for a fuscous to dark fuscous medial longitudinal spot on posterior ½ of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ovicape to length of tergum V 0.59:1. Apex of piercer unique in shape having 1 pair of reduced subapical lobes (Fig. 280A).

ATTRACTANT: No known record.

COMMENTS

B. phaleriae is similar to *B. carbonaria* (Hendel) in possessing the scutellum almost entirely

darkened but differs in having humeral calli yellow (with anterior $\frac{1}{2}$ brown), notopleural calli red-brown, scutellum almost entirely red-brown, facial spots absent, mesonotum and abdomen uniformly dark orange-brown. There is a large number of other species that have colourless wings and colouration on the scutellum in varying shapes and intensities, i.e. *B. atramentata* (Hering), *B. buinensis*, *B. daruensis*, *B. enochra* (Drew), *B. picea* (Drew), *B. trifaria* (Drew) and species in the *fagraea* complex. *B. phaleriae* differs from these species in having the scutellum entirely darkened except for a small yellow area on each anterolateral corner.

Originally, May (1955) described the mesopleural stripe as "almost attaining humeral callus". However it is narrower, ending at the anterior npl. bristle.

***Bactrocera (Bactrocera) picea*
(Drew), n. comb. (Fig. 281)**

Dacus (Strumeta) piceus Drew, 1972b: 208–10.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6992) in QM.

DISTRIBUTION

Recorded from Russell I. and the Shortland Is (Solomon Islands), also Bougainville I. (type locality, Buin).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral calli glossy black with an irregular longitudinal fulvous band through centre; notopleural calli yellow; mesonotum glossy black, mesopleural stripe slightly wider than notopleural callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow except for a broad medial longitudinal glossy black band; wing with a pale fuscous tint around costal margin and a broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga glossy black except posterior margin of tergum V tending dark fuscous.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. picea was described adequately by Drew (1972b). It is similar to *B. atramentata* (Hering) in possessing colourless wings except for costal band and anal streak, mesonotum black with lateral postsutural vittae present and medial postsutural vitta absent, scutellum yellow with a broad medial

longitudinal black band, abdominal terga uniformly black and costal cells colourless. It differs from this species in being a small species and having humeral calli glossy black with a fulvous band in centre, lateral postsutural vittae broad, a broader black band on scutellum, costal band absent, mid and hind femora and hind tibiae black.

***Bactrocera (Bactrocera) pisinna*, n. sp.
(Fig. 282)**

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Kaindi (1400 m), attracted to cue lure, 16.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: Mt Kaindi (between 1200 m and 1550 m), 1 ♂ 2.iii.1981, 1 ♂ 29.iii.1981, 1 ♂ 4.v.1981, 1 ♂ 23.xi.1981, 1 ♂ 14.xii.1981, A. Allison, all paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10557) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 3 paratypes in DPI.

DISTRIBUTION

Known only from Mt Kaindi, Morobe Province, Papua New Guinea.

DIAGNOSIS

Very small species; facial spots absent; humeral and notopleural calli yellow; mesonotum glossy black, postsutural vittae absent, mesopleural stripe of medium width, scutellum yellow; wing with a narrow costal band and a narrow transverse band across centre which encloses both crossveins, costal cells dark fuscous, microtrichia covering both costal cells; abdomen with a glossy appearance and with broad lateral dark fuscous to black margins on terga III and IV and with the centre portions of terga III–V fuscous.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 0.83 mm. Frons of even width, length 1.38 times breadth; dark fulvous with no dark markings, anteromedial hump reduced and covered by a few short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous, facial spots absent; length of face 0.28 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput dark fuscous, yellow along eye margins; occipital row with 6–8 small pale bristles. Antennae with segments 1 and 2 red-brown; segment 3 red-brown with fuscous on apex and outer surface; a weak red-brown dorsal bristle on segment 2; arista black (red-brown basally); length of segments: 0.05 mm; 0.15 mm; 0.38 mm.

Thorax mesonotum glossy black. Pleural areas glossy black except red-brown above fore coxae. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black). Lateral and medial postsutural vittae absent. Postnotum glossy black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. (reduced); mpl. 1; npl. 2; scp. 4; all bristles (except sa.) well developed and black.

Legs fore coxae fulvous, mid and hind coxae dark fuscous; remaining segments fulvous except mid and hind tibiae fuscous; mid tibiae each with an apical black spur.

Wings length 3.5 mm; costal cells dark fuscous; microtrichia covering both costal cells; remainder of wings colourless except for a dark fuscous subcostal cell, narrow dark fuscous costal band confluent with R_{2+3} and ending at extremity of M, a narrow transverse dark fuscous band across wing and enclosing both crossveins, a narrow dark fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen rounded with a glossy appearance; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous centrally, black laterally, with a narrow transverse red-brown band along posterior margin and ending before lateral margins; tergum II dark fuscous to black with a narrow transverse red-brown band along posterior margin but not reaching lateral margins; terga III–V fuscous except for broad lateral dark fuscous to black margins on terga III and IV. A pair of oval shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. pisinna is similar to *B. retrorsa* in possessing infuscation on wing in addition to costal band and anal streak, mesonotum black with lateral and medial postsutural vittae absent and scutellum entirely yellow. It differs from this species in having costal cells fuscous, a narrow transverse fuscous band across wing enclosing both crossveins, humeral calli yellow, abdominal terga dark fuscous and all femora entirely fulvous.

Bactrocera (Bactrocera) psidii (Froggatt), n. comb. (Figs 283–285)

Tephritis psidii Froggatt, 1899: 500–1.

Dacus psidii: Froggatt, 1909: 86; Malloch, 1931: 263, 1938: 115.

Dacus virgatus Coquillett, 1910: 13; Malloch, 1931: 264 (syn.).

Strumeta psidii: Perkins, 1939: 18–19.

Dacus ornatissimus Froggatt, 1909: 93 (partim, lectotype only); Drew, 1974a: 76 (syn.).

Dacus (Strumeta) psidii: Drew, 1974a: 76–8.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION). LOCATION OF TYPES: *T. psidii*, unknown (no type material was mentioned in the original description by Froggatt); *D. virgatus*, holotype ♀ (No. 12738) in NMNH; *D. ornatissimus*, lectotype ♂ in NSW.

DISTRIBUTION

Restricted to New Caledonia (type locality).

DIAGNOSIS

Medium sized species; generally small fuscous to dark fuscous facial spots present; humeral calli yellow except anterodorsal corner black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe equal in width to notopleural callus, short lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad triangular black marking on dorsal surface; wing with a narrow tint of extremely pale fuscous colouration around costal margin and a narrow fulvous anal streak, a narrow tint of fuscous colouration around r–m and dm–cu crossveins, costal cells colourless to extremely pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga entirely glossy black.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 2 pairs of subapical bristles (Fig. 284). Spicules at distal end of middle segment of medium width with 8–11 small dentations of approximately even length (Fig. 285).

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. psidii was described adequately by Drew (1974a). It is similar to *B. obliqua* (Malloch) in possessing infuscation on crossveins and scutellum yellow with a broad black triangular marking on dorsal surface. It differs from this species in having the face fulvous with small pale spots in 75 per cent of specimens, costal band narrow and not overlapping R_{2+3} , r–m crossvein shorter than

dm-cu crossvein, infuscation around crossveins very narrow and pale, legs entirely fulvous, lateral postsutural vittae elongate and ending before upper pa. bristles.

As discussed by Drew (1974a), the type series of *D. ornatissimus* Froggatt consists of 2 species, *B. psidii* and *B. musae*. Despite the labelling of the specimens (type or cotype), Froggatt (1909) did not designate a type in his original description. In order to prevent future nomenclatural problems I designate the male labelled "New Caledonia, 4.4.97, bred guava, type WWF" as the lectotype. This is a specimen of *B. psidii* whereas the paralectotypes are all specimens of *B. musae*.

***Bactrocera (Bactrocera) reclinata*, n. sp.**

(Fig. 286)

TYPE SPECIMENS

Holotype ♂, BOUGAINVILLE I.: Daru Village, attracted to methyl eugenol, 30.v.1970, R.M. Berena.

Paratype, BOUGAINVILLE I.: 1 ♂, Daru Village, attracted to methyl eugenol, May 1970, R.M. Berena.

LOCATION OF TYPES: Holotype (T.10558) in QM; 1 paratype in DPI.

DISTRIBUTION

Known only from Bougainville I.

DIAGNOSIS

Medium sized species; very large oval black facial spots present; humeral calli yellow; notopleural calli black; mesonotum black, mesopleural stripe of medium width ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae narrow and very short, medial postsutural vitta absent, scutellum yellow with a very broad medial longitudinal shining black band; legs generally dark fuscous to black except basal areas of femora fulvous and basal segment of tarsi fulvous; wing with a narrow fuscous costal band and broad fuscous anal streak, a narrow U-shaped fuscous band across centre costal cells colourless, microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga I-V generally shining black.

DESCRIPTION

MALE: Head generally dark in colour. Vertical length 1.7 mm. Frons narrowing slightly posteriorly, length 1.67 times breadth; uniformly fuscous, anteromedial hump covered with a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex dark fuscous. Face dark fulvous with

large irregularly oval black spots; length of face 0.55 mm. Genae dark fulvous, fuscous subocular spot present; black bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with 7 strong black bristles. Antennae with segments 1 and 2 dark fulvous with fuscous markings, segment 3 fuscous; a strong black dorsal bristle on segment 2; arista black (dark fulvous basally); length of segments: 0.28 mm; 0.40 mm; 1.03 mm.

Thorax mesonotum and pleural areas shining black without pale markings. Yellow markings as follows: humeral calli (anterior $\frac{1}{3}$ and broad ventral margin fuscous); medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{4}{7}$ lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing sharply posteriorly to end midway between sa. and lower pa. bristles. Notopleural calli black. Postnotum black. Scutellum yellow except for a broad medial longitudinal shining black band which encloses the apical sc. bristles. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; npl.2; mpl. 1; scp. 4; all bristles well developed and black.

Legs all coxae dark fuscous; fore femora with apical $\frac{1}{2}$ dark fuscous to black (basal $\frac{1}{2}$ fulvous), mid femora black except for a fulvous tint basally, apical $\frac{1}{2}$ hind femora black (basal $\frac{1}{2}$ fulvous); fore tibiae fuscous, mid tibiae dark fuscous, hind tibiae black; all tarsal segments fuscous except basal segment fulvous; rows of long black bristles on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.5 mm; costal cells colourless; microtrichia in outer $\frac{1}{3}$ second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, a U-shaped fuscous band across wing enclosing both crossveins and recurving back along CuA_1 towards base of wing, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I-V shining black except for 2 narrow transverse orange-brown markings on lateral margins of tergum II either side of midline. A pair of oval black shining spots on tergum V. Posterior

lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. reclinata is similar to *B. anfracta* in possessing a distinct fuscous marking across wing, mesonotum black with lateral postsutural vittae present and medial postsutural vitta absent and scutellum with a large black triangular marking on dorsal surface but differs in having a unique fuscous band across wing enclosing both crossveins and recurving back to enclose CuA₁.

***Bactrocera (Bactrocera) retrorsa*, n. sp.** (Fig. 287)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Stony logging area, Bulolo, attracted to methyl eugenol, 4.iii.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 2 ♂♂, Upper Manki logging area, Bulolo, 15.iv.1980, P. Daur; 1 ♂, Upper Stony logging area, Bulolo, 7.iii.1980, P. Daur; 1 ♂, Bubia, Lae, 4.i.1960, J.H. Ardley. Northern District: 1 ♂, Lejo plantation, 13.ii.1975, E.S.C. Smith. All paratypes attracted to methyl eugenol.

LOCATION OF TYPES: Holotype (T.10559) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 3 paratypes in DPI.

DISTRIBUTION

Known from the Morobe Province and Northern District, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized subquadrate black facial spots present; humeral calli black dorsally and dark fuscous ventrally; notopleural calli yellow; mesonotum black, mesopleural stripe of medium width (just wider than notopleural callus), lateral and medial postsutural vittae absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, a large irregularly shaped fuscous pattern across centre; abdominal terga I–V black except for dark fuscous along either side of a medial longitudinal black band on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.46 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered with a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous.

Face fulvous with medium sized subquadrate black spots; length of face 0.55 mm. Genae fulvous, large fuscous subocular spot present; fuscous bristle present. Occiput fuscous, yellow along eye margins; occipital row with 7–10 well developed black bristles. Antennae with segments 1 and 2 fulvous; segment 3 fuscous except fulvous along ventral margin; a strong fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.40 mm; 1.0 mm.

Thorax mesonotum and pleural areas black without pale markings. Yellow markings as follows: notopleural calli; medium sized mesopleural stripe, slightly wider than notopleural callus dorsally, continuing to sternopleuron as a very small fuscous marking, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior ½ lower hypopleural calli (remainder including broad ventral margins black). Humeral calli black dorsally, dark fuscous ventrally. Lateral and medial postsutural vittae absent. Postnotum black. Scutellum yellow except for broad black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; npl. 2; mpl. 1; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; apical ⅓ of all femora dark fuscous (remainder fulvous); fore and mid tibiae pale fuscous, hind tibiae dark fuscous; all tarsal segments fulvous; rows of long dark setae on dorsal surfaces of fore femora; middle tibiae each with an apical black spur.

Wings length 7.0 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R₂₊₃ and ending between extremities of R₄₊₅ and M, a fuscous pattern across wing beginning as a narrow band enclosing r–m crossvein then expanding into a large oval pattern and recurving back along underside of CuA₁, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V black except for dark fuscous either side of a medial longitudinal black band on tergum V. A pair of oval shining spots on tergum V which are black on lateral ½ and dark fuscous on inner ½. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. retrorsa is similar to *B. pisinna* in possessing a black mesonotum with lateral and medial postsutural vittae absent and wings with distinct fuscous markings in addition to costal band and anal streak. It differs from this species in having colourless costal cell, a broad dark fuscous blotch across wings which encloses both crossveins and most of discoidal cell, humeral calli black, abdomen uniformly black and femora fulvous with apices dark fuscous. It is similar to *B. biarcuata* (Walker) in general wing and body colouration, but this species is geographically restricted to Bougainville I. and possesses lateral postsutural vittae.

Bactrocera (Bactrocera) robiginosa
(May), n. comb. (Fig. 288)

Strumeta robiginosa May, 1957b: 305–6; May, 1963: 50.

MATERIAL EXAMINED

Holotype ♀, Stoney Creek, Cairns District, Queensland, 8.xi.1955, A.W.S. May. In the original description, May (1957b) noted the collector as W. Pont, however the specimen label states A.W.S. May.

LOCATION OF TYPE: Holotype (T.5592) in QM.

DISTRIBUTION

Stoney Creek, Cairns, Queensland (type locality).

DIAGNOSIS

Medium sized species; small oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs entirely fulvous; wing with a narrow fuscous costal band and anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; all abdominal terga pale orange-brown except for very narrow medial longitudinal bands on terga III, IV and V which are very pale fuscous on tergum III, fuscous on tergum IV and black on tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.7 mm. Frons of even width, length 1.6 times breadth; fulvous without dark markings; anteromedial hump covered by a large number of short dark setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small circular black spots; length of face 0.5 mm. Genae fulvous, pale

brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 3–6 red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.33 mm; 0.83 mm.

Thorax mesonotum red-brown with very narrow pale fuscous lateral longitudinal bands. Pleural areas red-brown except pale fuscous on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); 2 broad lateral postsutural vittae ending at upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 6.6 mm; costal cells fulvous (second cell slightly paler); microtrichia in outer corner of second costal cells only; remainder of wings with a pale fuscous tint except fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; super-numerary lobe weak.

Abdomen oval; terga free; no pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V pale orange-brown except for narrow medial longitudinal bands on tergum III, IV and V which are very pale fuscous on tergum III, fuscous on tergum IV and black tergum V. A pair of oval fuscous shining spots on tergum V. Basal segment of ovipositor red-brown, conical in transverse cross section and tapering posteriorly in dorsal view; aculeus needle shaped at its tip. Ratio of length of ov scape to length of tergum V 0.63:1.

ATTRACTANT: No known record. Earlier record of attraction to cue lure (Drew and Hooper, 1981) is doubtful.

COMMENTS

B. robiginosa is similar to *B. moluccensis*

(Perkins) and species in the *bidentata* complex in possessing a red-brown mesonotum, costal cells coloured with microtrichia in outer corner of second costal cell only, abdominal terga III–V pale without distinct lateral dark colour patterns. It differs from these species in having a narrow medial longitudinal indistinct band on tergum III becoming pale fuscous on tergum IV and fuscous on tergum V and with fuscous to black shining spots on tergum V.

Bactrocera (Bactrocera) rutila
(Hering), n. comb. (Fig. 289)

Strumeta rutila Hering, 1941a: 45–6.

Dacus (Bactrocera) rutilus: Hardy, 1983: 15.

MATERIAL EXAMINED

PAPUA NEW GUINEA: holotype ♀, 1896, Biro; paratype ♀ in BMNH with the following labels - "N. Guinea, Biro, 96", "Lenien Berlinhafen", "*Strumeta rutila* det. Hering 1940", INDONESIA, Irian Jaya: 1 ♂ in BMNH with 2 labels, "Neth. Ind.— American New Guinea Expedit, Bernhard Camp 50 m, 6.x.1938, J. Olthof" and "*Strumeta rutila* Hering", the latter in Hering's handwriting.

LOCATION OF TYPES: Holotype in HNHM, paratype ♀ in BMNH.

DISTRIBUTION

Known from Papua New Guinea (type locality, Berlinhafen) and Irian Jaya. The label data on the specimens studied is vague, exact locality being unavailable.

DIAGNOSIS

Small species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with a pair of fine pale fuscous lines inside lateral postsutural vittae, mesopleural stripes reaching midway between anterior margin of notopleural callus and anterior npl. bristles, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and anal streak, costal cells pale fulvous (second cell slightly paler), microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown except for a fuscous to dark fuscous band across anterior margin of tergum III and a similar elongate spot posterocentrally on tergum V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.48 times breadth; fulvous with pale fuscous around orbital bristles; anteromedial hump covered by a

small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized subquadrate black spots; length of face 0.43 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput red-brown, fulvous along eye margins; occipital row with 5–6 strong dark bristles. Antennae with segments 1 and 2 fulvous; segment 3 absent in paratype; a red-brown dorsal bristle on segment 2; length of segments: 0.15 mm; 0.28 mm.

Thorax mesonotum red-brown except for a pair of narrow pale fuscous longitudinal lines inside lateral postsutural vittae. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); 2 lateral postsutural vittae of even width and ending just before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1 (absent in paratype); mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells pale fulvous (second cell slightly paler); microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark red-brown; tergum II dark red-brown across anterior $\frac{2}{3}$ and widening to cover lateral margins (remainder fulvous); terga III–V red-brown except for a narrow fuscous to dark fuscous band along anterior margin of tergum III and a narrow medial longitudinal fuscous spot on posterior $\frac{1}{2}$ of tergum V. A pair of oval red-brown shining spots on tergum V. Basal segment of ovipositor red-brown, oval in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V

0.74:1. Apex of piercer with 2 pairs of strong subapical keels.

ATTRACTANT: No known record.

COMMENTS

Drew (1974a) made *B. rutila* a synonym of *B. moluccensis* (Perkins). These species, together with *B. turneri* are identical on the standard characters used for identification. The study of females however, reveals that these are good species; the apex of the piercer is needle shaped in *B. turneri*, possessing a pair of weak subapical keels in *B. moluccensis* and having 2 pairs of strong subapical keels in *B. rutila*. There are no other characters on which these species can be confidently separated.

***Bactrocera (Bactrocera) samoae*, n. sp.** (Fig. 290)

TYPE SPECIMEN

Holotype ♀, WESTERN SAMOA: Utumapu, 14.xii.1968, B. Hocking.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Known only from Western Samoa.

DIAGNOSIS

Small species; facial spots absent; humeral calli glossy black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to anterior npl. callus, lateral and medial postsutural vittae absent, scutellum yellow; wing with a narrow fuscous costal band, anal streak absent, costal cells colourless with microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga II–V orange-brown with a medial longitudinal dark fuscous band on terga III–V and 2 lateral longitudinal glossy black bands on terga II–V.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.1 mm. Frons of even width, length 1.85 times breadth; fulvous with fuscous laterally from s.or. bristles to vertex; orbital bristles dark fuscous: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous without dark spots; length of face 0.3 mm. Genae fulvous, brown subocular spot present. Occiput black, fulvous along eye margins; occipital row with 4 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a weak pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.08 mm; 0.23 mm; 0.50 mm.

Thorax mesonotum and pleural areas glossy

black. Yellow markings as follows: notopleural calli; mesopleural stripe reaching anterior npl. bristle dorsally, continuing to sternopleuron as a small pale spot, anterior margin convex; upper hypopleural calli (posterior apices glossy black); anterior $\frac{3}{5}$ lower hypopleural calli (remainder glossy black). Humeral calli glossy black. Lateral and medial postsutural vittae absent. Postnotum glossy black. Scutellum yellow except narrow black basal band. Bristles; sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs all segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 4.1 mm; costal cells colourless; microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, a narrow fuscous costal band confluent with R_{2+3} and widening slightly at wing apex. Anal streak reduced to a pale fuscous tint in posterior cubital cell; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; terga II–V orange-brown with a moderately broad medial longitudinal dark fuscous to black band on terga III–V and 2 broad lateral longitudinal glossy black bands over terga II–V. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor glossy black, conical in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 1.17:1. Apex of piercer needle shaped.

ATTRACTANT: No known record.

COMMENTS

B. samoae is similar to *B. passiflorae* (Froggatt) in having a glossy black mesonotum, black humeral calli, yellow notopleural calli, yellow scutellum, lateral and medial postsutural vittae absent, facial spots absent and wings with a narrow fuscous costal band. It differs from *B. passiflorae* in possessing a unique abdominal colour with tergum I black, terga II–V orange-brown with a medial dark fuscous band on terga III–V and broad lateral longitudinal glossy black bands over terga II–V.

Bactrocera (Bactrocera) seguyi (Hering), n. comb. (Fig. 291)

Strumeta (Bactrocera) seguyi Hering, 1939: 165–6.

Dacus peculiaris Malloch, 1939a: 235; Hering, 1941a: 53 (syn.).

Dacus (*Neodacus*) *seguyi*: Hardy, 1954: 12.
Dacus (*Strumeta*) *seguyi*: Drew, 1974a: 79–81.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).
 LOCATION OF TYPES: *S. seguyi*, holotype ♀ in MNHN; *D. peculiaris*, holotype ♂ in NMNH.

DISTRIBUTION

Widespread over Papua New Guinea, Irian Jaya (type locality, either Humboldt Bay or Dorey [= Manokwari]) and New Britain, where it is common in lowland rainforest areas.

DIAGNOSIS

Large species; large black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a broad recurved fuscous band across centre of wing and a narrow fuscous transverse band across apex of wing, first costal cell fuscous, second costal cell colourless in centre with fuscous around margins, microtrichia covering second costal cell and outer $\frac{3}{4}$ of first costal cell; abdominal terga II–IV fulvous and tergum V red-brown except for a black transverse band across anterior margin of tergum II, a broad medial longitudinal black band over all 4 terga and 2 lateral longitudinal black bands on terga III–V.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. seguyi was described adequately by Drew (1974a). It is similar to *B. curvifera* (Walker) in possessing a broad fuscous blotch across centre of wing enclosing both crossveins and most of discoidal cell, mesonotum black with lateral postsutural vittae present, medial postsutural vitta absent and scutellum entirely yellow. It differs from this species in having the mesopleural stripe extending to humeral callus, costal cells fuscous, abdominal terga II–V fulvous with a broad medial longitudinal black band over all 4 terga and 2 broad lateral longitudinal black bands on terga III–V.

Bactrocera* (*Bactrocera*) *setinervis (Malloch), n. comb. (Fig. 292)

Dacus setinervis Malloch, 1938: 112–3.

Strumeta setinervis: Perkins, 1938: 6.

Dacus (*Strumeta*) *setinervis*: Drew, 1974a: 81–3.

MATERIAL EXAMINED

Holotype ♂, (No.1182), north-west side of Henderson I. at 100 ft., June 1934, E.C. Zimmerman.

LOCATION OF TYPE: Holotype in BPBM.

DISTRIBUTION

Henderson I. (type locality).

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow; notopleural calli fuscous; mesonotum glossy black, mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae absent, scutellum glossy black except lateral margins yellow; wing with a narrow fuscous costal band (discontinuous in centre of wing) and a pale fulvous colouration in anal cell, costal cells colourless with microtrichia in outer corner of second costal only; abdominal terga II–V glossy black except for irregularly shaped fulvous spots towards centre of each tergum either side of a broad medial longitudinal fuscous band.

ATTRACTANT: No known record.

COMMENTS

B. setinervis was described adequately by Drew (1974a). It is similar to *B. kirki* in possessing colourless wings except for costal band and anal streak, lateral and medial postsutural vittae absent, scutellum with a broad black band on dorsal surface and humeral calli yellow but differs in having facial spots absent and notopleural calli black.

Bactrocera* (*Bactrocera*) *strigata (Perkins), n. comb. (Figs 293–295)

Chaetodacus strigatus Perkins, 1934: 43–4.

Strumeta strigatus: May, 1963: 50.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).
 LOCATION OF TYPES: Perkins (1934) did not designate types and no specimens to which the original description can be attributed have been found.

DISTRIBUTION

Known from Stanthorpe (type locality), Gatton and Gayndah in south-east Queensland and Bairnsdale, Victoria.

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow; notopleural calli dark orange-brown; mesonotum red-brown, mesopleural stripe reaching anterior npl. bristle, very short lateral postsutural vittae present, medial postsutural vitta

absent, scutellum fuscous except anterolateral corners yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak and a narrow transverse fuscous band across centre of wing which encloses both crossveins, first costal cell pale fulvous, second costal cell very pale fulvous, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for fuscous on lateral margins of tergum III, pale fuscous to very pale fuscous on lateral margins of terga IV and V, a narrow medial longitudinal band which is very pale fuscous on posterior of tergum III, fuscous on tergum IV and black on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.55 times breadth; fulvous with at most, pale fuscous around orbital bristles and on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with dark facial spots absent; length of face 0.45 mm. Genae fulvous, subocular spots absent; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–6 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a very strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.53 mm.

Thorax mesonotum red-brown with a mottled appearance due to sites of attachment of dorsoventral flight muscles. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; medium sized mesopleural stripe, reaching anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margins straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{1}{2}$ lower hypopleural calli (remainder red-brown); 2 very short lateral postsutural vittae tapering posteriorly to end just behind sa. bristles. Notopleural calli dark orange-brown. Postnotum red-brown. Scutellum fuscous except for anterolateral corners yellow. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with a apical black spur.

Wings length 5.3 mm; first costal cell pale fulvous, second costal cell very pale fulvous;

microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and widening in apex of wing to end between extremities of R_{4+5} and M, narrow transverse fuscous band across wing and enclosing both crossveins, broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I orange-brown except for narrow fuscous lateral margins; tergum II orange-brown; terga III–V orange-brown except for broad fuscous lateral margins on tergum III, narrow pale fuscous to very pale fuscous lateral margins on terga IV and V and a medial longitudinal band which is very pale fuscous on posterior area of tergum III, fuscous on tergum IV and black on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 1:1. Apex of piercer broad, narrowing sharply with 1 pair of subapical keels, 2 pairs of small subapical bristles (Fig. 294). Spicules at distal end of middle segment of medium width with a large number of small (sometimes indistinct) dentations (Fig. 295).

ATTRACTANT: No known record.

COMMENTS

B. strigata is similar to *B. angustifasciata*, *B. ismayi*, *B. lampabilis* (Drew), *B. longicornis* Macquart, *B. reclinata*, *B. unilineata* and species in the *frauenfeldi* complex in possessing infuscation across wing as one or more transverse bands and scutellum with a large fuscous or black triangular marking on dorsal surface. It differs from these species in having a red-brown mesonotum and a broad fuscous longitudinal band on the dorsal surface of the scutellum.

***Bactrocera (Bactrocera) thistletoni*, n. sp.** (Fig. 296)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western Highlands

District: Mt Hagen, 31.iii.1981, attracted to cue lure, B. Thistleton.

Paratypes, PAPUA NEW GUINEA, Western Highlands District: 1 ♂, Mt Hagen, 31.iii.1981, B. Thistleton. Central Province: 1 ♂, Bisianumu, Sogeri Plateau, 25.vi.1980, R.A.I. Drew and D.W. Currey. Western District: 1 ♂, Nomad, 17.xi.1980, P. Senat. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10560) in QM; 1 paratype in ANIC; 2 paratypes in DPI.

DISTRIBUTION

Known from the Western Highlands District, Central Province and Western District, Papua New Guinea.

DIAGNOSIS

Medium sized species; face dark fuscous with large oval black facial spots filling the antennal furrows; humeral calli dark fuscous to black; notopleural calli yellow; mesonotum black, mesopleural stripe of medium width (extending almost to anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow with a broad black basal band; wing with a narrow fuscous costal band and a broad fuscous anal streak, costal cells colourless with microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V black except for a narrow transverse orange-brown band across posterior margin of tergum V and extending as a narrow margin either side of a narrow medial longitudinal dark fuscous band on this tergum.

DESCRIPTION

MALE: Head generally dark coloured. Vertical length 1.5 mm. Frons of even width, length 1.48 times breadth; dark fulvous except dark fuscous centrally on lower $\frac{1}{2}$; anteromedial hump covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fulvous. Ocellar triangle black. Vertex fuscous. Face dark fuscous with 2 large oval black spots filling antennal furrows; length of face 0.45 mm. Genae dark fulvous, dark brown subocular spot present; black bristle present. Occiput black, fulvous along eye margins; occipital row with 6–8 well developed black bristles. Antennae with segments 1 and 2 dark fulvous, segment 3 fuscous; a strong dark fulvous bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.80 mm.

Thorax mesonotum uniformly black. Pleural areas black without pale markings. Yellow markings as follows: notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, not continuing to

sternopleuron, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{3}{5}$ lower hypopleural calli (remainder including broad ventral margins black). Postnotum black. Scutellum yellow except for a broad black basal band. Humeral calli black dorsally, dark fuscous ventrally. Lateral and medial postsutural vittae absent. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and fuscous to black.

Legs fore coxae dark fuscous, mid and hind coxae dark fuscous to black; fore and mid femora black, hind femora with apical $\frac{1}{2}$ black and basal $\frac{1}{2}$ fulvous; fore and mid tibiae fuscous, hind tibiae dark fuscous, all tarsal segments fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.2 mm; costal cells colourless; microtrichia covering outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with or just overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak, ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I and II black except for 2 transverse orange-brown bands posterolaterally on tergum II; terga III–V black except for a narrow transverse orange-brown band across posterior margin of tergum V and extending as a narrow margin either side of a narrow medial longitudinal dark fuscous band on this tergum. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. thistletoni is similar to *B. passiflorae* (Froggatt) in possessing wings colourless except for costal band and anal streak, lateral and medial postsutural vittae absent, scutellum entirely yellow and humeral calli black but differs from this species in having large oval black facial spots, legs with fore and mid femora and apical $\frac{1}{2}$ of hind femora black, fore and mid tibiae fuscous and hind tibiae dark fuscous. It is similar to *B. lineata* (Perkins) in general body colour patterns but differs in having microtrichia in outer $\frac{1}{2}$ of second costal cell only, face dark fuscous with large black spots, lateral postsutural vittae absent and mesopleural

stripes extending almost to anterior npl. bristles.

This species is named after Dr B. Thistelton, Mt Hagen, who made extensive collections of Dacinae in Papua New Guinea.

***Bactrocera (Bactrocera) trifaria*
(Drew), n. comb. (Fig. 297)**

Dacus (Strumeta) trifarius Drew, 1971: 87–9.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6962) in QM.

DISTRIBUTION

New Britain (type locality, Keravat).

DIAGNOSIS

Medium sized species; large black facial spots present; humeral calli fuscous to black; notopleural calli yellow; mesonotum fuscous to black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a broad medial dark fuscous to black band; wing with a narrow pale fuscous costal band and broad pale fuscous anal streak, costal cells pale fulvous with microtrichia in outer corner of second costal cell only; abdominal terga fulvous except for a broad medial and 2 broad lateral longitudinal black bands over all terga and joined along anterior margin of tergum I.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. trifaria was described adequately by Drew (1971). It is similar to *B. enochra* (Drew) from Bougainville I. in general wing and body colour patterns, but differs in having the mesonotum generally black, humeral calli fuscous to black, scutellum mostly fuscous to black and abdomen with broad lateral and medial longitudinal black bands over terga I–V. *B. trifaria* is similar to *B. atramentata* (Hering) and *B. picea* (Drew) in possessing the mesonotum black (or almost black), scutellum yellow with a medial longitudinal fuscous or black band and wings colourless except for costal band and anal streak. It differs from these species in having abdominal terga not entirely black and costal cells pale fulvous (not colourless).

***Bactrocera (Bactrocera) umbrosa*
(Fabricius), n. comb. (Fig. 298)**

Dacus umbrosus Fabricius, 1805: 274.

Dacus fascipennis Wiedemann, 1819: 28; Bezzi, 1913: 72 (syn.); Hardy, 1968: 146 (syn.).

Bactrocera fasciatipennis Doleschall, 1856: 412; Osten-Sacken, 1881 (fide Bezzi, 1913: 69) (syn.).

Dacus conformis Walker, 1857: 34; Osten-Sacken, 1881 (fide Bezzi, 1913: 69) (syn.).

Dacus diffusus Walker, 1860: 153; Hardy, 1959: 169–70 (syn. and lectotype designation), not Hardy and Adachi (1954) as referenced by Drew (1974a).

Dacus frenchi Froggatt, 1909: 92–3; Bezzi, 1919: 417 (syn.).

Dacus (Bactrocera) umbrosus: Malloch, 1939b: 412; Drew 1982: 75–8.

Strumeta umbrosa: Perkins, 1939: 12.

Strumeta frenchi: Perkins, 1939: 13.

Dacus (Strumeta) umbrosus: Hardy and Adachi, 1954: 184; Drew, 1974a: 88–92.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: *D. umbrosus*, holotype (sex ?) in ZMC; *D. fascipennis*, holotype ♂ in NHMV; *B. fasciatipennis*, unknown; *D. conformis*, holotype ♀ in BMNH; *D. diffusus*, lectotype ♂ in BMNH; *D. frenchi*, holotype ♀ unknown.

DISTRIBUTION

Widespread throughout South East Asia (type locality, Sumatra), Papua New Guinea, islands of the Bismarck Archipelago, Bougainville I., Solomon Islands, Vanuatu (formerly New Hebrides) and New Caledonia where it occurs in very large populations in lowland areas, particularly in disturbed situations.

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching to humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, 3 transverse fuscous bands across wing with the basal 1 joining with the anal streak, costal cells fulvous with microtrichia in outer ½ of second costal cell only; abdominal terga varying from orange-brown with a medial longitudinal black stripe on terga IV and V to orange-brown with a broad medial and 2 broad lateral longitudinal black bands over terga III–V.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. umbrosa bears no close resemblance to other species. It is easily recognised by 3 broad transverse bands across the wings which are red-brown, not the usual fuscous colour.

To conform with the decision made for specimens previously considered types of other

Walker species (see COMMENTS under *B. curvifera*), the male designated as lectotype of *D. diffusus* by Hardy (1959) should not be regarded as a type. The female of this species noted by Hardy (1959) may be regarded as a syntype.

***Bactrocera (Bactrocera) unilineata*, n. sp.**
(Fig. 299)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, 6.iv.1980, attracted to cue lure, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Upper Manki logging area, Bulolo, 15.iv.1980, P. Daur; 1 ♂, Upper Stony logging area, Bulolo, 15.ii.1980, P. Daur; 2 ♂♂, Mt Missim (1500 m and 1600 m), near Wau, 30.x.1980, A. Allison; 2 ♂♂, Mt Missim (1525 m), 20.xi.1980, A. Allison; 7 ♂♂, Mt Missim (1350 m, 1500 m, 1525 m, 1550 m, 1600 m), 18.xii.1980, A. Allison; 1 ♂, Mt Kaindi (1230 m), 19.i.1981, A. Allison. Western Highlands District: 1 ♂, Highlands Agricultural Experiment Station, Mt Hagen, 21.x.1980, B. Thistleton. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10561) and 1 paratype (T.10562) in QM; 3 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 9 paratypes in DPI.

DISTRIBUTION

Known from Morobe Province and Western Highlands District, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots absent; humeral and notopleural calli yellow; mesonotum shining black, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow with a medial longitudinal triangular black band; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells with a very pale fulvous tint, microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdominal terga I–V black except for orange-brown either side of a medial longitudinal black band on tergum II, a medial longitudinal black band on tergum V and a narrow dark fuscous band along posterior margin of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.52 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous.

Face fulvous without dark markings; length of face 0.48 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fuscous, fulvous along eye margins; occipital row with 4–7 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong dark fuscous to black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum and pleural areas shining black without pale markings. Yellow markings as follows: humeral calli (narrow anterolateral margins black); notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, not continuing to sternopleuron (or if it does it is very small), anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder including ventral margins black); 2 lateral postsutural vittae of medium width, narrowing sharply posteriorly to end approximately midway between sa. and lower pa. bristles. Postnotum black. Scutellum yellow except for a narrow triangular marking on dorsal surface with apex between the sc. bristles. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; femora fulvous tending darker apically; fore tibiae pale fuscous, mid tibiae fulvous except fuscous basally, hind tibiae dark fuscous; all tarsal segments fulvous; mid tibiae each with an apical black spur; rows of short dark setae on dorsal surfaces of fore femora.

Wings length 6.0 mm; costal cells with a very pale fulvous tint; microtrichia in outer $\frac{1}{2}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin, a narrow fuscous transverse band across wing enclosing both crossveins; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V black except for orange-brown either side of a broad medial longitudinal black band on tergum II and a narrow dark fuscous band along posterior margin of tergum V. A pair of oval orange-brown to fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. unilineata is similar to *B. angustifasciata*, *B. ismayi*, *B. lampabilis* (Drew), *B. longicornis* Macquart and *B. reclinata* in having infuscation on the wing as a transverse band in addition to costal band and anal streak, mesonotum black with medial postsutural vitta absent and scutellum yellow with a large black triangular marking on dorsal surface. It differs from *B. ismayi*, *B. lampabilis*, *B. longicornis* and *B. reclinata* in having 1 narrow transverse fuscous band across the wing enclosing both crossveins, and from *B. angustifasciata* in having abdominal terga black, costal cells with a pale fuscous tint, costal band confluent with R_{2+3} and humeral calli black around anterior and dorsal margins.

Bactrocera (Bactrocera) unipunctata
(Malloch), n. comb. (Fig. 300)

Dacus unipunctatus Malloch, 1939a: 245–6.

Dacus (Strumeta) unipunctatus: Drew, 1974a: 94–6.

MATERIAL EXAMINED

Holotype ♂, Tulagi, Florida I., Solomon Islands, R.A. Lever (no date).

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Tulagi, Florida I., Solomon Islands (type locality).

DIAGNOSIS

Small species; small black facial spots present; humeral and notopleural calli yellow; mesonotum shining red-brown without dark markings, mesopleural stripe reaching to humeral callus, short lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and an extremely pale fulvous anal streak, costal cells colourless, microtrichia covering both costal cells; all abdominal terga shining orange-brown with a large circular black spot on anterocentral margin of tergum V.

ATTRACTANT: No known record.

COMMENTS

B. unipunctata was described adequately by Drew (1974a). Known only from the holotype, it is provisionally placed in *Bactrocera* as the presence or absence of the pecten on abdominal tergum III cannot be confirmed on this damaged teneral specimen. It is similar to *B. humilis* (Drew and Hancock), *B. mutabilis* (May) and species in the *tryoni* complex in possessing wings colourless

except for costal band and anal streak, mesonotum red-brown and dense microtrichia covering most of both costal cells. It differs from *B. mutabilis* in having facial spots present and from the other species in having all abdominal terga shining orange-brown with a large circular black spot on anterocentral margin of tergum V and without other dark colour patterns.

Subgenus **Gymnodacus** Munro

Bactrocera (Gymnodacus) calophylli
(Perkins and May), n. comb. (Figs 301–303)

Asiadacus calophylli Perkins and May, 1949: 16–18.

Dacus (Gymnodacus) calophylli: Hardy, 1951: 130–1.

Gymnodacus calophylli: May, 1963: 42, 49.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); 8 specimens of the type series.

LOCATION OF TYPES: Lectotype ♀ (T.5259) and paralectotype ♂ (T.5258) in QM; 6 paralectotypes in UQ.

DISTRIBUTION

Known only from coastal rainforests in the Cairns district, Queensland (type locality).

DIAGNOSIS

Small to medium sized species; facial spots small and elongate; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe of medium width reaching anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs generally fulvous with fore tibiae very pale fuscous and hind tibiae pale fuscous; wing with a broad fuscous costal band, anal cell pale fuscous and anal streak absent, costal cells with a very pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a broad transverse black band across anterior margin of tergum III and a broad medial longitudinal black band over all 3 terga and narrow lateral fuscous margins on terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.67 times breadth; fulvous with fuscous on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small elongate fuscous spots; length of face 0.38 mm. Genae fulvous, large fuscous subocular spot present; fuscous bristle present. Occiput red-brown, fulvous along eye margins; occipital row with a large number of small

dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.25 mm; 0.58 mm.

Thorax mesonotum black except brown markings as follows: below and behind lateral postsutural vittae, inside lateral postsutural vittae, around mesonotal suture, inside humeral calli. Pleural areas black except pale below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width and narrowing posteriorly to end well before upper pa. bristles. Postnotum black. Scutellum yellow except for narrow fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except fore tibiae very pale fuscous and hind tibiae pale fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.2 mm; costal cells with a very pale fuscous tint; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and overlapping this vein at extremity (there is a very narrow pale fuscous area above R_{4+5} beyond r-m crossvein), pale fuscous in anal cell (anal streak absent); no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous; tergum II orange-brown with a narrow transverse black band across anterior area but not reaching lateral margins; terga III–V orange-brown except for a broad transverse black band across anterior margin of tergum III (anterolateral corners of tergum III dark fuscous), a broad medial longitudinal black band over all 3 terga, narrow lateral fuscous margins on terga IV and V. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of oviscapae to length of tergum V 0.52:1. Apex of piercer elongate, narrow and rounded at tip with

3 pairs of very small subapical bristles (Fig. 302). Spicules at distal end of middle segment indistinct, of medium width, with 7–12 very small dentations of even size (Fig. 303).

ATTRACTANT: No known record.

COMMENTS

B. calophylli, *B. hastigerina* (Hardy) and *B. petila* are the only species of subgenus *Gymnodacus* known in the South Pacific region. *B. calophylli* is distinct in having a black mesonotum, broad costal band confluent with R_{4+5} , abdominal terga III–V orange-brown with a broad medial longitudinal black band and 2 narrow lateral longitudinal dark bands which are joined along base of tergum III by a broad black band. Originally, Perkins and May (1949) did not define type specimens. The authors stated that the species was "described from two males and six females bred from fruits of *Calophyllum inophyllum* Linn. collected at Cairns in February, 1938". Two of these specimens (T.5258 and T.5259 in QM), a male and a female, each have a holotype label while the other 6 specimens in UQ bear paratype labels. I designate the female (T.5259) as lectotype and the remaining specimens paralectotypes.

Bactrocera (Gymnodacus) hastigerina (Hardy), n. comb.

Dacus (Gymnodacus) hastigerinus Hardy, 1954: 19–21; Drew, 1974a: 10.

MATERIAL EXAMINED

NEW BRITAIN: 1 ♂ paratype, Keravat, bred ex *Spondias* sp., October 1949, N.L.H. Krauss.

LOCATION OF TYPE: Holotype ♂ in NMNH.

DISTRIBUTION

Keravat, New Britain (type locality).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and very narrow pale fuscous anal streak, costal cells pale fuscous with microtrichia in outer corner of second costal cell only; abdominal terga III–V red-brown with a narrow medial longitudinal pale fuscous band over all 3 terga.

ATTRACTANT: No known record.

COMMENTS

B. hastigerina was described adequately by Hardy (1954) and Drew (1974a). It differs from *B. calophylli* (Perkins and May) in having the mesonotum red-brown with a pattern of fuscous markings, costal band narrow (overlapping R₂₊₃ but not reaching R₄₊₅) and abdominal terga III–V red-brown with a narrow medial longitudinal pale fuscous band.

***Bactrocera (Gymnodacus) petila*, n. sp.**
(Fig. 304)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Nami Creek, Mt Kaindi (1650 m), attracted to cue lure, 4.v.1981, A. Allison.

LOCATION OF TYPE: Holotype (T.10563) in QM.

DISTRIBUTION

Known only from Nami Creek, Mt Kaindi, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized irregularly oval black facial spots present; humeral and notopleural calli yellow; mesonotum black with a broad medial longitudinal dark fuscous pattern, mesopleural stripe narrow and equal in width to notopleural callus, lateral postsutural vittae of medium width and ending at or just before upper pa. bristles, medial postsutural vitta absent, scutellum yellow; wing with a fuscous tint and with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous, microtrichia in outer corner of second costal cell only; abdominal tergum III black, abdominal terga IV and V fuscous except for a broad medial longitudinal black band and 2 broad lateral longitudinal black bands joining along anterior margin of tergum IV.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.5 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered with a small number of short dark setae; orbital bristles dark fuscous: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with medium sized irregularly oval black spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; fuscous bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with 3–5 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface;

a red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.19 mm; 0.26 mm; 0.78 mm.

Thorax mesonotum black except for a medial longitudinal dark fuscous pattern. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; narrow mesopleural stripe, equal in width to notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior ½ lower hypopleural calli (remainder including broad ventral margins black); 2 lateral postsutural vittae of medium width, narrowing slightly posteriorly to end at or just before upper pa. bristles. Postnotum black. Scutellum yellow except for a narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs all coxae dark fuscous; all other segments fulvous except fore tibiae fuscous and hind tibiae dark fuscous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.6 mm; costal cells fuscous (second cell slightly paler); microtrichia in outer corner of second costal cell only; remainder of wings with a pale fuscous tint, a fuscous subcostal cell, a narrow fuscous costal band overlapping R₂₊₃ and ending between extremities of R₄₊₅ and M, a broad fuscous anal streak ending at wing margin; no dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe of medium development.

Abdomen elongate-oval; terga free; no pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II red-brown except for a broad transverse black band across anterior ⅔ and widening to cover lateral margins; tergum III black; terga IV and V fuscous except for a broad medial longitudinal black band and 2 broad lateral longitudinal black bands which join along anterior margin of tergum IV and a narrow transverse red-brown band across posterior margin of tergum V. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. petila is similar to *B. buloloensis* and *B. congener* (subgenus *Bactrocera*) in possessing colourless wings except for costal band and anal streak, mesonotum mostly black, abdominal terga

not entirely black, lateral postsutural vittae ending posterior to sa. bristles and costal cells pale fuscous to fuscous. It differs from these species in having the mesonotum with a very broad dark fuscous band anteromedially, abdominal terga fuscous to black with red-brown posterocentrally on tergum IV and centrally on tergum V and pecten on tergum III absent. It differs from the other species of subgenus *Gymnodacus*, *B. calophylli* (Perkins & May) and *B. hastigerina* (Hardy), in having the mesonotum and abdomen almost all black.

Subgenus *Notodacus* Perkins

Bactrocera (*Notodacus*) *xanthodes* (Broun), n. comb. (Figs 305–307)

Tephrites (*Dacus*) *xanthodes* Broun, 1905: 3–4.

Dacus (*Tephrites*) *xanthodes*: Froggatt, 1909: 91.

Chaetodacus xanthodes: Bezzi, 1928: 105–6.

Dacus xanthodes: Malloch, 1931: 260–61.

Notodacus xanthodes: Perkins, 1937: 56–7; Perkins, 1939: 24–5.

Dacus (*Notodacus*) *xanthodes*: Hardy, 1955b: 434; Drew, 1974a: 11–14.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION). LOCATION OF TYPES: No types were designated by Broun (1905) and no specimens to which the original description can be attributed are known to exist. In the original description, *B. xanthodes* was recorded as being bred from fruits imported into New Zealand from Suva, Tonga and Rarotonga in the Cook Is.

DISTRIBUTION

Known from Fiji, Western Samoa, Tonga, Cook Is and Vanuatu (formerly New Hebrides). Drew's statement (1974a) that this species probably does not occur in the Cook Is is incorrect (Bateman 1985).

DIAGNOSIS

Medium sized species; small black facial spots present; humeral calli fulvous except for a broad yellow band on posterior $\frac{2}{3}$; notopleural calli orange-brown; mesonotum transparent with a shining orange-brown colouration and with irregular dark markings, broad lateral yellow band running from humeral calli to end just before lateral postsutural vittae, large yellow spot on pleural region in place of the normal mesopleural stripe, lateral postsutural vitta present and beginning anterior to mesonotal suture, medial postsutural vitta present, scutellum orange-brown with lateral yellow margins; wing with a narrow fuscous costal band and a broad fulvous anal

streak, costal cells extremely pale fulvous with microtrichia in outer corner of second costal cell only; all abdominal terga transparent and shining orange-brown with no dark markings.

DESCRIPTION

FEMALE: Ovipositor apex of piercer rounded at tip with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 306). Spicules at distal end of middle segment of medium width with 7–12 dentations of markedly uneven length (Fig. 307).

HOST PLANTS

NEW RECORDS: 1 commercial host, watermelon, *Citrullus lanatus* (Cucurbitaceae), December 1985, in Tonga (pers. comm. Plant Quarantine and Health Branch, Canberra, Australia); 1 wild host, *Barringtonia edulis* (Barringtoniaceae), Efate, Vanuatu, 4.xii.1986, E. Kanas.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. xanthodes was described adequately by Drew (1974a). It is a unique species having a pair of well developed humeral bristles, the integument on the head, thorax and abdomen transparent and giving a mottled appearance due to internal tissues being visible, a soft integument particularly noticeable on the abdomen where the terga fold ventrally in dead specimens.

Subgenus *Polistomimetes* Enderlein

Bactrocera (*Polistomimetes*) *decurtans* (May), n. comb. (Figs 308–310)

Daculus decurtans May, 1965: 61–2.

MATERIAL EXAMINED

A large series of specimens (including 1 paratype) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6310) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Northern Territory (type locality, Berrimah), including Melville I. and northern Western Australia.

NEW RECORDS: Torres Strait islands: Badu, Moa (Banks), Yorke and Queensland: eastern coastal areas of Cape York Peninsula (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; large circular black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe

reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except fore tibiae pale fuscous and hind tibiae fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous with microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga III–V orange-brown except for a narrow transverse dark fuscous band along anterior margin of tergum III, narrow pale fuscous margins on each tergum, a medial longitudinal band which is fuscous on posterior $\frac{1}{3}$ of tergum III, dark fuscous on tergum IV and black on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.57 times breadth; fulvous with at most, pale fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with large circular black spots; length of face 0.43 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 5–9 red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a red-brown dorsal bristle on segment 2; arista red-brown (fulvous basally); length of segments: 0.18 mm; 0.28 mm; 0.73 mm.

Thorax mesonotum red-brown without dark markings. Pleural areas fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices fuscous); anterior $\frac{3}{5}$ lower hypopleural calli (remainder fuscous); 2 broad lateral postsutural vittae narrowing slightly posteriorly to end before upper pa. bristles. Postnotum fuscous. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except fore tibiae pale fuscous and hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.7 mm; costal cells pale fuscous

(second cell paler); microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 - CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I pale fuscous; tergum II orange-brown, tending fulvous along posterior margin either side of midline; terga III–V orange-brown except for a narrow transverse dark fuscous band across anterior margin of tergum III, narrow pale fuscous lateral margins on terga III, IV and V and a medial longitudinal band which is fuscous on posterior $\frac{1}{3}$ of tergum III, dark fuscous on tergum IV and black on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 - CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.74:1. Apex of piercer broad with 3 pairs of subapical keels; 3 pairs of subapical bristles (1 large and 2 small) (Fig. 309). Spicules at distal end of middle segment of medium width with 10–16 dentations of uniform size (Fig. 310).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. decurtans is similar to *B. fuscalata* and *B. murrayi* (Perkins) in possessing yellow humeral calli, mesonotum red-brown or dark fuscous with lateral postsutural vittae present and medial postsutural vitta absent. It is similar to *B. murrayi* and differs from *B. fuscalata* in having a uniformly red-brown mesonotum, wings colourless except for costal band and anal streak and abdominal terga orange-brown with dark markings. It differs from *B. murrayi* in having the lateral postsutural vittae ending before the upper pa. bristles and the apex of the piercer of the ovipositor with 3 pairs of subapical lobes. *B. decurtans* and *B. bidentata* (May) are similar in external body colour patterns and in possessing a trilobed apex of aculeus. Although *B. decurtans* is placed in subgenus *Polistomimetes*, (lacking prsc. and sa. bristles), it may be a subgenus *Bactrocera* species. *B. decurtans*

and *B. bidentata* can be separated on the slight difference in shape of the apex of aculeus (Figs 61, 309).

***Bactrocera (Polistomimetes) fuscalata*, n. sp.**
(Fig. 311)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau, attracted to methyl eugenol, 1.xii.1980, A. Allison.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Mt Misim (1600 m), 11.xii.1980, A. Allison. Western Highlands District: 1 ♂, Kuk Agricultural Research Institute, Mt Hagen, 28.x.1980, B. Thistleton. Paratypes attracted to methyl eugenol.

LOCATION OF TYPES: Holotype (T.10564) in QM; 2 paratypes in DPI.

DISTRIBUTION

Known from Morobe Province and Western Highlands District, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous without dark spots; humeral and notopleural calli yellow; mesonotum dark fuscous, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing generally fuscous, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga III–V dull black.

DESCRIPTION

MALE: Head generally dark fulvous. Vertical length 1.43 mm. Frons narrowing slightly posteriorly, length 1.38 times breadth; dark fulvous without dark markings; anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fulvous. Ocellar triangle black. Vertex dark fulvous. Face fulvous without dark spots; length of face 0.58 mm. Genae dark fulvous, large fuscous subocular spot present; black bristle present. Occiput fuscous, fulvous along eye margins; occipital row with 4–5 well developed black bristles. Antennae with segments 1 and 2 dark fulvous, segment 3 fulvous except dark fuscous on apex and outer surface; a black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum dark fuscous. Pleural areas dark fuscous, tending black on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, ending midway between anterior margin of

notopleural callus and anterior npl. bristle dorsally, anterior margin slightly convex; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous); 2 parallel sided lateral postsutural vittae ending at upper pa. bristles. Postnotum dark fuscous. Scutellum yellow except for narrow dark fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs fore coxae dark fuscous, mid and hind coxae fuscous; fore femora dark fuscous, mid and hind femora fuscous; fore and hind tibiae fuscous, mid tibiae fulvous; basal segment of tarsi fulvous, remaining segments fuscous; mid tibiae each with an apical black spur; fore femora with a row of long pale setae on dorsal surface.

Wings length 6.0 mm; costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; remainder of wings fuscous except for a dark fuscous subcostal cell, dark fuscous along costal margin to apex of R_{2+3} , a narrow dark fuscous anal streak reaching wing margin; a dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I wider than long. Abdominal sterna I and II slightly longer than wide. Tergum I dark fuscous to black; tergum II dark fuscous; terga III–V dull black. A pair of oval dull black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. fuscalata is similar to *B. decurtans* (May) and *B. murrayi* (Perkins) in possessing a pale mesonotum, yellow humeral calli, lateral postsutural vittae present and medial postsutural vitta absent but differs from these species in having the mesonotum dark fuscous, fuscous colouration over the apical $\frac{1}{2}$ of wing and abdominal terga III–V dull black.

***Bactrocera (Polistomimetes) mesonotochra*, n. sp.**
(Fig. 312)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Bubia, near Lae, 28.xii.1963, D.K. McAlpine.

LOCATION OF TYPE: Holotype (T.10565) in QM.

DISTRIBUTION

Known only from Bubia, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with medium sized black spots; humeral calli yellow (pale red-brown along anterior and ventral margins); notopleural calli yellow; broad yellow band connecting humeral and notopleural calli; mesonotum pale red-brown, lateral and medial postsutural vittae present, mesopleural stripe of medium width reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing with a broad fuscous costal band confluent with R_{4+5} , costal cells fuscous, dense microtrichia covering both costal cells; abdominal terga III–V orange-brown with a narrow transverse fuscous band along anterior margin of tergum III and with fuscous on lateral margins of tergum III and anterolateral margins of terga IV and V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.56 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of small dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized oval black spots, not reaching epistoma; length of face 0.6 mm. Genae fulvous, fuscous subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4–7 well developed black bristles. Antennae segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a dark dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.2 mm; 0.40 mm; 1.08 mm.

Thorax mesonotum pale red-brown. Pleural areas pale red-brown except fuscous along anterior margin of mesopleural stripe. Yellow markings as follows: humeral calli (pale red-brown along anterior and ventral margins); notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; a broad band connecting humeral and notopleural calli; 2 lateral postsutural vittae tapering posteriorly to end before the upper pa. bristles; a broad medial postsutural vitta rounded posteriorly at level of upper pa. bristles and tapering anteriorly to end at level of mesonotal suture; upper hypopleural calli (posterior apices pale red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder pale red-brown). Postnotum pale red-brown. Scutellum yellow except for narrow red-

brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except with a pale fuscous tint on basal $\frac{1}{2}$ of fore tibiae and on hind tibiae; mid tibiae each with an apical black spur; fore femora with a row of long setae on dorsal and ventral surfaces.

Wings length 6.2 mm; costal cells fuscous, dense microtrichia covering both costal cells; remainder of wings colourless except for dark fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and overlapping R_{4+5} at apex of wing where it merges into the general membrane colour, anal streak absent but with fuscous tint in anal cell; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I wider than long. Abdominal sterna I and II as long as wide. Tergum I pale fuscous; tergum II orange-brown, tending whitish posteriorly and pale fuscous on lateral margins; terga III–V covered with a dense golden pubescence, orange-brown except for a narrow transverse fuscous band along anterior margin of tergum III which widens to cover lateral margins, anterolateral margins of terga IV and V fuscous. A pair of oval fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a moderate concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. mesonotochra is similar to *B. neopagdeni*, *B. pagdeni* (Malloch) and *B. visenda* (Hardy) in possessing lateral and medial postsutural vittae. It differs from *B. neopagdeni* and *B. pagdeni* and is similar to *B. visenda* in having wings not entirely infuscated and abdominal terga orange-brown with dark patterns. It differs from *B. visenda* in lacking a transverse fuscous band across the wing and in having the humeral and notopleural calli joined by a lateral yellow band, the mesopleural stripe of medium width and not extending to the humeral callus.

Bactrocera (Polistomimetes) murrayi
(Perkins), n. comb. (Figs 313–315)

Daculus murrayi Perkins, 1939: 25–6; May, 1963: 41, 49.
Dacus (Daculus) murrayi: Hardy, 1951: 125–7; Drew, 1974a: 3–6.

MATERIAL EXAMINED

A series of specimens (including paralectotypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Lectotype ♂ in SAM (see Drew 1974a).

DISTRIBUTION

PREVIOUSLY RECORDED: Eastern coastal areas of north Queensland (north from Innisfail) and the Torres Strait islands: Moa (Banks), Murray (type locality).

NEW RECORDS: Torres Strait islands: Badu, Stephens, Thursday (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized circular black facial spots present; humeral and notopleural calli yellow; mesonotum pale red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a dark fuscous to black transverse band across anterior margin of tergum III and fuscous to dark fuscous narrow lateral margins on terga III, IV and V and a medial longitudinal black band over all 3 terga which ends before posterior margin of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.7 mm. Frons narrowing slightly posteriorly, length 1.6 times breadth; fulvous with, at most, pale fuscous on anteromedial hump; latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized circular black spots; length of face 0.53 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4–9 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.80 mm.

Thorax mesonotum pale red-brown without dark markings. Pleural areas fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices fuscous);

anterior $\frac{2}{3}$ lower hypopleural calli (remainder fuscous); 2 parallel sided lateral postsutural vittae reaching upper pa. bristles. Postnotum fuscous. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.7 mm; costal cells fulvous (second cell slightly paler); microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M , broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I red-brown; tergum II fulvous except for a broad transverse red-brown band across anterior $\frac{1}{3}$, widening to cover lateral margins and with a narrow transverse black band across centre; terga III–V orange-brown except for a transverse dark fuscous to black band across anterior margin of tergum III, narrow fuscous to dark fuscous lateral margins on each tergum and a medial longitudinal black band over all 3 terga but ending before posterior margin of tergum V. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.2:1. Apex of piercer narrow and needle shaped at tip with 4 pairs of subapical bristles (2 large and 2 small) (Fig. 314). Spicules at distal end of middle segment of medium width with 8–10 small dentations of approximately equal size (Fig. 315).

HOST PLANTS

NEW RECORD: 10 ♀♀ and 9 ♂♂ ex *Ficus* sp. (Moraceae), Erty Beach, near Innisfail, north Queensland, January 1983, A. Stocker.

ATTRACTANT: No known record.

COMMENTS

B. murrayi can be confused with *B. decurtans* (May). Both species have a uniformly red-brown mesonotum, humeral calli yellow, lateral postsutural vittae present, medial postsutural vitta absent, colourless wings except for costal band and anal streak and abdominal terga orange-brown with dark markings. *B. murrayi* differs in having the lateral postsutural vittae ending at the upper pa. bristles and the apex of the piercer of the ovipositor needle shaped.

***Bactrocera (Polistomimetes) neopagdeni*, n. sp.**
(Fig. 316)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Central Province: 20 km SE Port Moresby, hand collected on bushes, 26.i.1985, J.W.Ismay.

LOCATION OF TYPE: Holotype (T.10567) in QM.

DISTRIBUTION

Known only from the Central Province, Papua New Guinea.

DIAGNOSIS

Medium to large sized species; facial spots present; yellow humeral and notopleural calli connected by a broad yellow band; mesonotum dark red-brown, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae present, scutellum yellow; legs fulvous except basal $\frac{2}{3}$ of fore tibiae and hind tibiae fuscous; wing with a broad fuscous costal band, anal streak reduced to very pale infuscation within anal cell, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III–V fulvous except for 2 broad lateral longitudinal fuscous bands over all 3 terga and connected along anterior margin of tergum III.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.8 mm. Frons of even width, length 1.5 times breadth; fulvous without dark markings, anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 3 i.or. (1 pair very small); lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with moderately large pear shaped black spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fulvous; occipital row with 4–6 strong black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface;

a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segment: 0.20 mm; 0.35 mm; 0.95 mm.

Thorax mesonotum red-brown without dark markings. Pleural areas red-brown except fuscous along anterior margin of mesopleural stripe. Yellow markings as follows: humeral calli; notopleural calli; a broad band connecting humeral and notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly concave; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 narrow parallel sided lateral postsutural vittae ending before upper pa. bristles; a moderately broad medial postsutural vitta rounded posteriorly at level of upper pa. bristles and narrowing anteriorly to end just behind level with mesonotal suture. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except basal $\frac{2}{3}$ of fore tibiae and all of hind tibiae fuscous and apical 4 segments of fore tarsi red-brown; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.7 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings with a very pale fulvous tint except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and merging into tint across wing. The anal streak is reduced to a fulvous tint within the anal cell; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga free; no pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II red-brown except anterolateral corners fuscous and a narrow transverse fulvous band across posterior margin; terga III–V fulvous except for 2 broad lateral longitudinal fuscous to dark fuscous bands which are joined by a narrow fuscous to dark fuscous band along anterior margin of tergum III. A pair of oval red-brown shining spots on tergum V. Basal segment of ovipositor very long, red-brown and cylindrical so that it is circular in transverse cross section. Ratio of length of oviscape to length of tergum V 2.3:1. The apex of the piercer has 1 pair of subapical lobes and lateral indentations.

ATTRACTANT: No known record.

COMMENTS

B. neopagdeni is similar to *B. pagdeni* (Malloch) in the unique body shape and size and shape of the basal segment of the ovipositor but differs in possessing a red-brown mesonotum, a pale fulvous tint in wing membrane (not a general fuscous pattern), legs not entirely fulvous, abdominal terga III–V fulvous with broad lateral longitudinal fuscous bands (not entirely fuscous).

Bactrocera (Polistomimetes) pagdeni
(Malloch), n. comb. (Fig. 317)

Dacus pagdeni Malloch, 1939a: 243–5.

Dacus (Daculus) pagdeni Drew, 1974a: 6–8.

MATERIAL EXAMINED

Holotype ♀, Tulagi Ridge, Florida I., Solomon Is, March 1934, H.T. Pagden.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Florida I., Solomon Islands (type locality).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow and joined by a broad lateral yellow band; mesonotum dull black, mesopleural stripe reaching almost to anterior npl. bristle, narrow short lateral postsutural vittae present, medial postsutural vitta present, scutellum yellow; wing with a broad fuscous costal band and anal streak, entire wing membrane with a general fuscous colouration, costal cells fuscous, microtrichia covering both costal cells; abdominal terga III–V fuscous with shining spots on tergum V black.

ATTRACTANT: No known record.

COMMENTS

B. pagdeni was described adequately by Drew (1974a). It is similar to *B. neopagdeni* in general body shape, wing colour patterns, abdominal colouration and in having lateral and medial postsutural vittae but differs in having a black mesonotum, wings with a general fuscous colouration, legs entirely fulvous and abdominal terga entirely fuscous.

Bactrocera (Polistomimetes) toxopeusi
(Hering), n. comb. (Fig. 318)

Daculus toxopeusi Hering, 1953: 510.

Dacus (Daculus) toxopeusi Drew, 1974a: 8–10.

MATERIAL EXAMINED

Holotype ♂, Hollandia, Irian Jaya, July 1938, L.J. Toxopeus.

LOCATION OF TYPE: Holotype in RNH.

DISTRIBUTION

Irian Jaya (type locality, Hollandia, now known as Jayapura).

DIAGNOSIS

Medium sized species; large oval black facial spots present; humeral calli brown; notopleural calli yellow; mesonotum dull black, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a narrow pale fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia covering most of second costal cell; abdominal tergum I black, abdominal terga II–IV dark fuscous to black, abdominal tergum V dark orange-brown with anterior and anterolateral margins fuscous.

ATTRACTANT: No known record.

COMMENTS

B. toxopeusi was described adequately by Drew (1974a). It is similar to *B. decurtans* (May), *B. fuscata* and *B. murrayi* (Perkins) in having lateral postsutural vittae present and medial postsutural vitta absent but differs from these species in having a black mesonotum and black humeral calli.

Bactrocera (Polistomimetes) visenda
(Hardy), n. comb. (Figs 319–321)

Dacus (Heterodaculus) visendus Hardy, 1951: 134–8.

Daculus visendus May, 1963: 40, 49.

Dacus (Daculus) visendus Drew, 1974a: 10.

Dacus (Polistomimetes) visendus: Drew, 1979: 76.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION). LOCATION OF TYPE: Holotype ♂ in NMNH.

DISTRIBUTION

PREVIOUSLY RECORDED: Widespread in southern coastal areas of Papua New Guinea (Western and Central Provinces), eastern coastal areas of Queensland, north from latitude 17-db- S (type locality, Babinda).

NEW RECORDS: Torres Strait islands: Badu, Boigu, Darnley, Dauan, Horn, Murray, Saibai, Thursday, Yam (records from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli

yellow; mesonotum red-brown with irregular pale fuscous blotches, broad mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae present, scutellum yellow; legs fulvous except hind tarsi pale fuscous; wing with a broad fuscous costal band and anal streak, a broad fuscous band across centre of wing which encloses both crossveins, costal cells fuscous with microtrichia covering second costal cell and outer $\frac{1}{3}$ of first costal cell; abdominal terga III–V orange-brown with 2 broad lateral longitudinal fuscous to dark fuscous bands, oval shining spots on tergum V reduced to narrow transverse dark fuscous elongate markings.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.5 times breadth; fulvous with pale fuscous on anteromedial hump, latter covered by small number of short dark setae; orbital bristles red-brown to fuscous: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots; length of face 0.5 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 6–8 pale red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.30 mm; 0.85 mm.

Thorax mesonotum red-brown with irregular pale fuscous blotches. Pleural areas pale fuscous to dark fuscous. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin concave; upper hypopleural calli (posterior apices fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder fuscous); 2 narrow lateral postsutural vittae tapering posteriorly to end well before upper pa. bristles; a broad medial longitudinal postsutural vitta broadly rounded posteriorly and tapering anteriorly to end in a point just anterior of mesonotal suture. Postnotum fuscous. Scutellum yellow except for narrow fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 5.6 mm; costal cells fuscous; microtrichia covering second costal cell and outer $\frac{1}{3}$ of first costal cell; remainder of wings with a

pale fuscous tint except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} (except for a pale spot just beyond r-m crossvein) and not distinctly overlapping R_{4+5} at extremity of wing, a broad fuscous band across centre of wing from costal band to hind margin and enclosing both crossveins, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous; tergum II fulvous except for a broad transverse dark fuscous band across anterior $\frac{1}{2}$ and widening to cover lateral margins; terga III–V orange-brown except for 2 broad lateral longitudinal fuscous to dark fuscous bands over all 3 terga. A pair of narrow transverse dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment dark red-brown, oval in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.4:1. Apex of piercer needle shaped with 4 pairs of subapical bristles (1 pair large) (Fig. 320). Spicules at distal end of middle segment narrow with 3–5 dentations of equal size on intersegmental line and changing to large triangular scales proximally (Fig. 321).

ATTRACTANT: Methyl eugenol.

COMMENTS

B. visenda is similar to *B. mesonotochra* in possessing lateral and medial postsutural vittae, a red-brown mesonotum, wings not entirely infuscated and abdominal terga orange-brown with dark markings but differs in having a broad transverse fuscous band across wing, humeral and notopleural calli not joined by a lateral yellow band and mesopleural stripe reaching humeral callus.

Trypetidacus, n. subgen.

Bactrocera (Trypetidacus) invisitata, n. sp. (Fig. 322)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Kaindi (1450 m), attracted to methyl eugenol, 1.vi.1981, A. Allison.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, 25.v.1981, 1 ♂, 8.vi.1981, Mt Kaindi (1650 m), A. Allison; 2 ♂♂, Nami Creek, Mt Kaindi (1650 m), 11.v.1981, A. Allison; all above paratypes attracted to methyl eugenol. Eastern Highlands Province: 1 ♂, 1 ♀, Daulo Pass (2500 m), 2.v.1959, C.D. Michener; 1 ♂, Daulo Pass, 20.v.1968, J. and M. Sedlacek.

LOCATION OF TYPES: Holotype (T.10568) in QM; 7 paratypes in DPI.

DISTRIBUTION

Known from Mt Kaindi (above 1450 m), Morobe Province and Daulo Pass (2500 m), Eastern Highlands Province, Papua New Guinea.

DIAGNOSIS

Small glossy black species; facial spots absent; humeral calli yellow (except anterior $\frac{1}{4}$ pale fuscous); notopleural calli yellow; mesonotum glossy black, mesopleural stripe broad reaching anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow; wing with a very narrow fuscous costal band, anal streak absent, anal cell extension very short, costal cells with a very pale fuscous tint, microtrichia in extreme outer corner of second costal cell only; abdominal terga III and IV glossy dark fuscous to black except for irregular orange-brown markings posterocentrally on both terga and irregular fuscous markings anterocentrally on tergum IV, tergum V orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 0.93 mm. Frons of even width, length 1.53 times breadth; fulvous with fuscous around s.or. bristles and on anteromedial hump; latter with just a few small dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous, facial spots absent; length of face 0.38 mm. Genae fulvous, pale brown subocular spot present; red-brown bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with 5–8 small pale bristles. Antennae with all segments fulvous; no well developed dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.08 mm; 0.15 mm; 0.41 mm.

Thorax mesonotum glossy black without pale markings. Pleural areas glossy black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli (except anterior $\frac{1}{4}$ pale fuscous); notopleural calli; broad mesopleural stripe, extending to anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin convex; anterior $\frac{3}{4}$ lower hypopleural calli (remainder black). Upper

hypopleural calli glossy black. Lateral and medial postsutural vittae absent. Postnotum glossy black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 2; all bristles small and black.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous except apices of hind femora fuscous and hind tibiae entirely fuscous; mid tibiae each with an apical black spur.

Wings length 4.5 mm; costal cells with a pale to very pale fuscous tint; microtrichia in extreme outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, very narrow costal band confluent with R_{2+3} and widening slightly in apex of wing to reach M, very narrow infuscations around r-m and dm-cu crossveins, pale fuscous in anal cell; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak. The wing is long and narrow and the anal cell extension is short as in the subfamily Trypetinae.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I glossy dark fuscous to black; tergum II glossy dark fuscous to black except orange-brown across posterior margin; terga III and IV glossy dark fuscous to black except irregular orange-brown areas posterocentrally on both terga and fuscous anterocentrally on tergum IV; tergum V orange-brown except fuscous along anterior margin. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. invisitata is a unique species with some characters not present in other species of Dacinae. It has very short antennae and anal cell extension, characteristic of the Trypetinae. Also, this species has very long narrow wings with markings consisting of an extremely narrow costal band continuing around the wing margin to CuA_1 , narrow infuscation around crossveins and no distinct anal streak. The general wing venation and thoracic chaetotaxy are characteristic of Dacinae.

Melanodacus Group of Subgenera

Hemisurstylus, n. subgen.

Bactrocera (Hemisurstylus) melanoscutata, n. sp. (Fig. 323)

TYPE SPECIMENS

Holotype ♂, NEW BRITAIN: Lowlands Agricultural

Experiment Station, Keravat, bred from fruit of *Garcinia xanthochymus* in orchard, 3.ix.1970, D.F. O'Sullivan.

Paratypes, NEW BRITAIN: 2 ♂, bred from fruit of *G. xanthochymus*, Lowlands Agricultural Experiment Station, Keravat, 3.ix.1970, D.F. O'Sullivan.

LOCATION OF TYPES: Holotype (T.10569) in QM; 2 paratypes in DPI.

DISTRIBUTION

Known only from Keravat, New Britain.

DIAGNOSIS

Medium sized species; face fulvous with very large black facial spots; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width (ending just before anterior npl. bristle), scutellum yellow with a broad medial longitudinal black band; wing with a broad pale fuscous costal band and broad fuscous anal streak, costal cells pale fuscous, microtrichia in outer corners of both cells; abdominal terga II–V pale orange-brown except for a broad medial and 2 broad lateral longitudinal black bands over all 4 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 2.05 mm. Frons of even width, length 1.89 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump; latter covered by a large number of small pale bristles; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with very large oval black spots reaching epistoma; length of face 0.6 mm. Genae fulvous, fuscous subocular spot present; black bristle present. Occiput fuscous, yellow along eye margins; occipital row with 3–7 well developed black bristles and a large number of small paler bristles. Antennae with segments 1 and 2 fulvous, segment 3 fuscous; a black dorsal bristle on segment 2; arista black (fulvous basally); length of segment: 0.25 mm; 0.38 mm; 1.2 mm.

Thorax mesonotum black. Pleural areas black except dark fuscous below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, ending just before anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; 2 parallel sided lateral postsutural vittae ending just before upper pa. bristles; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder including ventral margin black). Postnotum black. Scutellum yellow except for a broad medial longitudinal black band.

Bristles: sc. 4; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; femora fulvous except apical $\frac{1}{3}$ of each femur dark fuscous; fore and mid tibiae fuscous, hind tibiae dark fuscous; tarsi fulvous; mid tibiae each with an apical black spur; fore femora with rows of long dark setae on dorsal surface.

Wings length 7.5 mm; costal cells pale fuscous, microtrichia in outer corners of both cells; remainder of wings with a very pale fuscous tint, a pale fuscous subcostal cell, broad pale fuscous costal band confluent with R_{4+5} (except for a paler area above this vein towards apex of wing) and ending between extremities of R_{4+5} and M, pale fuscous surrounding r–m crossvein, a broad fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III; tergum I and sterna I and II wider than long. Tergum I black. Terga II–V pale orange-brown except for a broad medial and 2 broad lateral longitudinal black bands which join at posterior end of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short and stout, sternum V with a slight concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. melanoscutata is distinct in having the posterior lobe of the surstylus short and stout (as in the *Bactrocera* group of subgenera), the posterior margin of abdominal sternum V with a slight concavity (as in the *Zeugodacus* group of subgenera), a broad black band on the scutellum, broad fuscous costal band confluent with R_{4+5} , pale infuscation over entire wing membrane and darker infuscation along r–m crossvein.

Subgenus *Hemizeugodacus* Hardy

***Bactrocera* (*Hemizeugodacus*) *abdomininigra*,**
n. sp. (Fig. 324)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Naibata Banda logging area, Bulolo, hand collected on ground, 13.v.1980, H. Ivagai.

LOCATION OF TYPE: Holotype (T.10570) in QM.

DISTRIBUTION

Known only from Bulolo, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli glossy black; posterior $\frac{1}{2}$ notopleural calli yellow (anterior $\frac{1}{2}$ glossy black), mesonotum glossy black, medium sized mesopleural stripe extending to anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow with a broad triangular black basal band; wing with a very narrow fuscous costal band and narrow fuscous anal streak, costal cells colourless with microtrichia in outer corner of second cell only; abdominal terga I–V glossy black except for 2 transverse orange-brown bands along posterior margin of tergum II either side of midline.

DESCRIPTION

MALE: Head vertical length 1.3 mm. Frons of even width, length 1.53 times breadth; fulvous with dark fuscous around orbital bristles and on anteromedial hump, latter covered with a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fuscous. Ocellar triangle black. Vertex dark fuscous. Face fulvous without dark facial spots; length of face 0.4 mm. Genae fulvous, brown subocular spot present; dark fuscous bristle present. Occiput black dorsally, fulvous ventrally, yellow along eye margins; occipital row with 6 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.23 mm; 0.60 mm.

Thorax mesonotum and pleural areas glossy black without pale markings. Yellow markings as follows: posterior $\frac{1}{2}$ of notopleural calli (anterior $\frac{1}{2}$ glossy black); medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{1}{2}$ lower hypopleural calli (remainder including broad ventral margins black). Lateral and medial postsutural vittae absent. Humeral calli glossy black. Postnotum glossy black. Scutellum yellow except for a broad glossy black basal band which is expanded into a triangle with apex in centre of scutellum. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae pale fuscous, mid and hind coxae dark fuscous; all other segments fulvous except apical $\frac{1}{3}$ of mid and hind femora black, mid tibiae fuscous and hind tibiae dark fuscous tending black basally; mid tibiae each with an apical black spur.

Wings length 5.2 mm; costal cells colourless; microtrichia in outer corner of second costal cell

only; remainder of wings colourless except fuscous subcostal cell, very narrow fuscous costal band confluent with R_{2+3} and ending at extremity of M, a narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I–V glossy black except for 2 narrow transverse orange-brown bands along posterior margin of tergum II either side of midline. A pair of oval glossy black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a slight concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. abdomininigra differs from the other species of subgenus *Hemizeugodacus* in having the mesonotum and abdominal terga uniformly glossy black and a black triangular marking on the dorsal surface of the scutellum.

***Bactrocera (Hemizeugodacus) aglaiae*
(Hardy), n. comb. (Figs 325–327)**

Dacus (Hemizeugodacus) aglaiae Hardy, 1951: 131–4.

Dacus (Hemizeugodacus) aglaiae: Hardy, 1952: 365 (emendation to *aglaiae*).

Neozeugodacus aglaiae: May, 1963: 50; May, 1953: 48.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); 1 ♀ paratype in UH, Atherton Tableland, February 1950, bred from *Aglaia sapindina*, N.L.H. Krauss; 2 ♀ paratypes in UH, Atherton Tableland, November 1949, bred from *Aglaia ferruginea*, N.L.H. Krauss.

LOCATION OF TYPE: Holotype ♂ in NMNH.

DISTRIBUTION

Known from Mossman, the Cairns district and the Atherton Tableland (type locality), Queensland, where its hosts grow in the eastern coastal rainforest.

DIAGNOSIS

Medium sized species; medium sized oval black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae present, scutellum yellow; legs entirely fulvous; wing with a pale fuscous tint and with a narrow fuscous costal band and anal streak, costal cells fulvous with microtrichia in outer corner of second costal cell

only; abdominal terga III–V fulvous with a medial longitudinal red-brown to pale fuscous band and broad lateral longitudinal red-brown bands over all three terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons of even width, length 1.63 times breadth; fulvous with pale fuscous around orbital bristles; anteromedial hump covered by a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous with medium sized oval black spots; length of face 0.53 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of well developed red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.33 mm; 0.90 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 parallel sided lateral postsutural vittae ending at upper pa. bristles; a broad medial postsutural vitta beginning at level of prsc. bristles and ending at level of mesonotal suture. Postnotum red-brown. Scutellum yellow except for a narrow red-brown basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical red-brown spur.

Wings length 6.7 mm; costal cells fulvous (second cell slightly paler); microtrichia in outer corner of second costal cell only; remainder of wings with a pale fuscous tint, except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and narrowing to end between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I and II red-brown except fulvous along

posterior margin of tergum II either side of midline; terga III–V fulvous except for a medial longitudinal band which is red-brown on tergum III and pale fuscous on terga IV and V and broad lateral longitudinal red-brown bands over all 3 terga. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.8:1. Apex of piercer broad, narrowing sharply and rounded at tip, with 4 pairs of small subapical bristles (Fig. 326). Spicules at distal end of middle segment of medium width with a large number of small dentations (Fig. 327).

HOST PLANTS

NEW RECORD: *Ganophyllum falcatum* (Sapindaceae), Kamerunga, Queensland, 4.i.1977, B. McCulloch, in association with *B. neohumeralis* (Hardy).

ATTRACTANT: No known record.

COMMENTS

B. aglaiae is similar to *B. aurea* (May) in possessing a red-brown mesonotum and abdominal terga orange-brown with dark markings but differs from this species in having a medial postsutural vitta present, mesopleural stripe of medium width and not reaching the humeral callus, scutellum entirely yellow and wing without a transverse fuscous band.

Bactrocera (Hemizeugodacus) *aurea*

(May), n. comb. (Fig. 328)

Neozeugodacus aureus May, 1951: 10–12; May, 1963: 50.
Dacus (Hemizeugodacus) *aureus*: Hardy, 1955b: 430 and 1956: 70–1.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.5262) in QM.

DISTRIBUTION

Ravensbourne, south-east Queensland (type locality).

DIAGNOSIS

Medium sized species; small circular black facial

spots present; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow except apical $\frac{1}{3}$ pale fuscous; legs fulvous except all femora pale fulvous on basal $\frac{2}{3}$ and hind tibiae fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, a broad pale fuscous band across centre of wing from R_{4+5} to hind margin and enclosing both crossveins, costal cells fuscous with microtrichia covering second costal cell and outer $\frac{1}{3}$ of first costal cell; abdominal terga II–V fulvous except for a broad red-brown band across base of tergum II and widening to cover lateral margins, a very broad medial longitudinal band over all 4 terga which is red-brown on terga II, III and anterior of tergum IV and dark fuscous on remainder of tergum IV and tergum V, 2 moderately broad lateral longitudinal red-brown bands over terga III–V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.65 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short dark setae; orbital bristles red-brown to black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small circular black spots; length of face 0.45 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 2–6 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a very strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segment: 0.13 mm; 0.23 mm; 0.65 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching humeral callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin concave; upper hypopleural calli (posterior apices red-brown); anterior $\frac{3}{5}$ lower hypopleural calli (remainder red-brown); 2 parallel sided lateral postsutural vittae ending before upper pa. bristles. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band and apical $\frac{1}{3}$ pale fuscous. Bristles: sc. 4; prsc. 2; pa. 2; sa. absent; mpl.1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except basal $\frac{2}{3}$ of all femora pale fulvous and hind tibiae fuscous; mid tibiae each with an apical black spur.

Wings length 5.6 mm; costal cells fuscous;

microtrichia covering second costal cell and outer corner of first costal cell; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, a broad transverse pale fuscous band across wing from R_{4+5} to hind margin and enclosing both crossveins, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I red-brown; terga II–V fulvous except for a broad transverse red-brown band across anterior margin of tergum II and widening to cover lateral margins, a very broad medial longitudinal band which is red-brown on terga II, III and anterior of tergum IV and dark fuscous on remainder of tergum IV and tergum V, moderately broad lateral longitudinal red-brown bands over terga III–V; pair of oval fulvous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.86:1.

ATTRACTANT: No known record.

COMMENTS

B. aurea is similar to *B. aglaiae* (Hardy) in possessing a red-brown mesonotum and abdominal terga orange-brown with dark markings but differs in having the medial postsutural vitta absent, mesopleural stripe reaching humeral callus, scutellum yellow with a red-brown spot on apex and wing with a single transverse fuscous band.

Subgenus *Melanodacus* Perkins

Bactrocera (*Melanodacus*) *nigra* (Tryon), n. comb. (Figs 329–331)

Dacus niger Tryon, 1927: 211–12.

Melanodacus niger: Perkins, 1937: 57.

Dacus (*Melanodacus*) *niger*: Hardy, 1951: 138–40.

Paratridacus niger: May, 1963: 42, 50.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: Lectotype ♂ (D.3136) and 3 paralectotypes (D.3136) in QM.

DISTRIBUTION

Known from the following localities in Queensland: Atherton, Cairns, Ayr, Maryborough and Nambour along the east coast and from Ravensbourne, Toowoomba in the southeastern highlands; type locality, Gympie or Cleveland (not specified on labels).

DIAGNOSIS

Small dark coloured species; medium sized oval facial spots present; humeral calli yellow (except anterodorsal corners glossy black); notopleural calli yellow; mesonotum glossy black, mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae absent, scutellum yellow with broad medial longitudinal glossy black band; wing with an indistinct very pale fulvous tint along costal margin, anal streak absent, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V glossy black except red-brown to pale along posterior margin of tergum V and extending along either side of a medial longitudinal glossy black band on tergum V.

DESCRIPTION

MALE: Head generally dark. Vertical length 1.25 mm. Frons of even width, length 2.1 times breadth; fulvous with broad pale fuscous markings along entire length, anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized oval black spots; length of face 0.38 mm. Genae fulvous, pale brown subocular spot present; black bristle present. Occiput black, fulvous along eye margins; occipital row with 4–6 well developed black bristle. Antennae with segments 1 and 2 fulvous, segment 3 fuscous; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.23 mm; 0.63 mm.

Thorax mesonotum and pleural areas glossy black without pale markings. Yellow markings as follows: humeral calli (except anterodorsal corners glossy black); notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black).

Lateral and medial postsutural vittae absent. Postnotum black. Scutellum yellow except for broad medial longitudinal band which encloses both apical bristles. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs femora fulvous except apical $\frac{1}{4}$ of mid and hind femora dark fuscous; fore tibiae pale fuscous, mid tibiae fuscous, hind tibiae dark fuscous; all tarsal segments fulvous; rows of long dark setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 4.6 mm; costal cells colourless; microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, a very narrow indefinite pale fuscous costal band ending between extremities of R_{4+5} and M (this band generally seems to be confluent with R_{2+3} but it is very pale and indefinite), a pale fuscous tint in anal cell (a definite anal streak is absent); no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Tergum I glossy black; tergum II glossy black except for 2 transverse fulvous spots along posterior margin either side of midline; terga III–V glossy black except red-brown to pale fuscous along posterior margin of tergum V and extending along either side of a medial longitudinal glossy black band; pair of oval glossy black shining spots on tergum V. Posterior lobe of surstylus short, sternum V with only a slight concavity on posterior margin.

FEMALE: Ovipositor basal segment glossy black, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.58:1. Apex of piercer needle shaped with 2 pairs of very small subapical bristles in a small socket (Fig. 330). Spicules at distal end of middle segment of medium width and either triangular or with 2 or 3 large dentations (Fig. 331).

HOST PLANTS

NEW RECORD: *Cryptocarya* sp. (Lauraceae), Cairns Botanical Gardens, November 1977, B. McCulloch.

ATTRACTANT: No known record.

COMMENTS

B. nigra is unique in Australia having glossy black pigmentation on the thorax and abdomen typical of many South Pacific species in countries outside Australia. The male possesses a short

posterior surstylus lobe and a slight concavity on posterior margin of sternum V. Other important characters are the glossy black medial longitudinal band on the dorsal surface of the scutellum and the absence of lateral and medial postsutural vittae. See comments for *B. satanellus* (Hering) for characters that separate these 2 species.

Originally, Tryon (1927) defined in the text a holotype, allotype and 1 paratype but the sex of these specimens was not recorded. In QM there are 4 specimens each with a white label marked "TYPE D/3136" but the specimen designated holotype cannot be determined. I designate one male (labelled "LECTOTYPE, R. Drew") as lectotype and the other 3 specimens paralectotypes (2 females and the sex of 1 cannot be determined).

Bactrocera (Melanodacus) satanellus
(Hering), n. comb. (Fig. 332)

Melanodacus satanellus Hering, 1941a: 48.

Dacus (Paratridacus) satanellus: Drew, 1973: 19–21.

MATERIAL EXAMINED

Paralectotype ♀, Kapakapa, Central District, Papua New Guinea, 1891, L. Loria and the following specimens in BMNH: paralectotype ♂ and lectotype ♀ labelled "paratype", "N. Guinea Mer, Kapakapa, Mag. Giugno. 1891, L. Loria", "*Melanodacus satanellus* det. Hering 1941", "F. Bearb. erh. V, Mus Budapest 27.iii.1941", "Purch from E.M. Hering B.M. 1965-270".

LOCATION OF TYPES: Lectotype ♀, paralectotype ♂ in BMNH; 1 ♂ and 1 ♀ paralectotype in HNHM.

DISTRIBUTION

Kapakapa, Central District, Papua New Guinea (type locality).

DIAGNOSIS

Small species; face glossy black; humeral calli glossy black; notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching just anterior to npl. bristle, lateral postsutural vittae present as short elongate spots, medial postsutural vitta absent, scutellum yellow with a narrow medial longitudinal glossy black band; wing membrane colourless except subcostal cell extremely pale fulvous, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga glossy black.

ATTRACTANT: No known record.

COMMENTS

Originally, Hering (1941a) listed a male and female type and did not designate a holotype. It is now apparent that there were more than 2 specimens in the type series, one male and one

female labelled syntype in HNHM (A. Dely — Draskovits, pers. comm.) and one male and one female labelled paratype in BMNH. The label data on the 4 specimens conform with Hering's description. I designate the female in BMNH as lectotype and the remaining 3 specimens paralectotypes.

Drew (1973) incorrectly stated that the male has a pecten on abdominal tergum III but it is absent; also the male has a short posterior surstylus lobe and the posterior margin of abdominal sternum V with a shallow concavity. These characters confirm the placement of this species in subgenus *Melanodacus*. The apex of the piercer of the ovipositor has an unusual apical cleft (Fig. 332A).

B. satanellus was described adequately by Drew (1973). It is similar to *B. nigra* (Tryon) in being a small glossy black species and in having wings with an indistinct costal band and anal streak. It differs from *B. nigra* in possessing a glossy black face, humeral calli glossy black, broader mesopleural stripe (reaching anterior of anterior npl. bristle) and 2 very short and narrow lateral postsutural vittae.

Queenslandacus Group of Subgenera

Queenslandacus, n. subgen.

Bactrocera (Queenslandacus) exigua
(May), n. comb. (Fig. 333)

Psilodacus exiguus May, 1957b: 300–1.

Daculus exiguus: May, 1963: 41, 49.

MATERIAL EXAMINED

Holotype ♂, Atherton, north Queensland, December 1955, J. Rosser; 1 ♀, Wallaman Falls, north Queensland, attracted to light trap, 31.i.1975, B.K. Cantrell.

LOCATION OF TYPE: Holotype (T.5607) in QM.

DISTRIBUTION

Known only from the higher altitude areas of Atherton (type locality) and Wallaman Falls, north Queensland.

DIAGNOSIS

Small species; facial spots absent; humeral and notopleural calli yellow; mesonotum uniformly black, mesopleural stripe reaching humeral callus, lateral and medial postsutural vittae absent, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band and anal streak and infuscation around r-m crossvein which extends as a pale fuscous tint into discoidal cell, costal cells pale fuscous to fuscous with microtrichia in outer 1/3 of second costal cell

only; abdominal terga I–V uniformly red-brown without dark markings.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.3 mm. Frons narrowing slightly posteriorly, length 1.38 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous, dark facial spots absent; length of face 0.43 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of very small pale setae. Antennae with all segments fulvous; a weak red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.65 mm.

Thorax mesonotum uniformly black except brown to dark brown around lateral margins, around mesonotal suture, inside humeral calli. Pleural areas red-brown except dark fuscous to black on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{3}{4}$ lower hypopleural calli (remainder dark fuscous). Lateral and medial postsutural vittae absent. Postnotum black. Scutellum yellow except for narrow brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 2; all bristles well developed and black.

Legs all segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 4.9 mm; costal cells pale fuscous to fuscous; microtrichia covering outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and narrowing beyond extremity of this vein to end between extremities of R_{4+5} and M, infuscation around r–m crossvein which continues into discoidal cell as a pale fuscous tint, broad pale fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I and sterna I and II wider than long. Terga I–V uniformly red-brown without dark markings. A pair of oval red-brown shining spots on tergum V. Basal segment of ovipositor red-brown, circular in transverse cross section and

tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 0.81:1.

MALE: As for female except posterior lobe of surstylus long; posterior margin of abdominal sternum V with a deep concavity.

ATTRACTANT: No known record.

COMMENTS

B. exigua does not fit into any previously established subgenus. The posterior lobe of the surstylus is elongate and the posterior margin of abdominal sternum V has a deep concavity and for this reason it is placed in a new subgenus. It is easily identified in having a black mesonotum without lateral postsutural vittae, a distinctive wing colour pattern of a narrow costal band and infuscation along r–m crossvein and a uniformly orange-brown abdomen.

Zeugodacus Group of Subgenera

Subgenus **Austrodacus** Perkins

Bactrocera (Austrodacus) cucumis (French), n. comb. (Figs 334–336)

Dacus tryoni var. *cucumis* French, 1907: 307.

Dacus cucumis: Froggatt, 1910: 866.

Austrodacus cucumis: Perkins, 1937: 56; May, 1953: 10; May, 1963: 39, 49, 65–6.

Dacus (Austrodacus) cucumis: Hardy, 1951: 122–5; Drew, 1972a: 11; Drew, 1982: 15–18.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Unknown.

DISTRIBUTION

PREVIOUSLY RECORDED: Occurs throughout the eastern coastal areas of Australia from Cape York in the north to northern New South Wales. See Drew (1982) for distribution map of eastern Australia (type locality, Bowen, Queensland); known also from the Northern Territory, although no fruit infestations have been recorded.

NEW RECORD: Torres Strait islands: Prince of Wales (record from Plant Quarantine Survey).

DIAGNOSIS

Medium sized species; small fuscous to black facial spots present; humeral and notopleural calli yellow; mesonotum orange-brown without dark markings, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow;

wing with a narrow fuscous costal band and anal streak, costal cells pale fulvous (second cell slightly paler than first), microtrichia in outer corner of second costal cell only; abdominal terga I and II orange-brown, terga III–V fulvous except for 2 broad lateral longitudinal orange-brown bands over all 3 terga and a narrow medial longitudinal band which is orange-brown on tergum III and orange-brown to dark fuscous on tergum IV and V (this band is broader on tergum V).

DESCRIPTION

FEMALE: Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.9:1. Apex of piercer broad with 1 pair of small subapical keels; 4 pairs of subapical bristles (2 large and 2 small) situated very close to apex (Fig. 335). Spicules at distal end of middle segment of medium width with 4–7 dentations, some broad and elongate and some small (Fig. 336).

ATTRACTANT: No known record.

COMMENTS

B. cucumis was described adequately by Hardy (1951) and Drew (1982). It is a pale orange-brown species with medial and lateral postsutural vittae present, a yellow scutellum, prsc. and sa. bristles absent, 4 sc. bristles present and a small elongate-oval black spot centrally on tergum V. It is a serious pest of a range of commercial cucurbit crops.

Subgenus *Diplodacus* May

Bactrocera (*Diplodacus*) *signatifer* (Tryon), n. comb. (Figs 337–339)

Dacus signatifer Tryon, 1927: 210–11.

Dacus (*Daculus*) *signatifer*: Hardy, 1951: 127–9.

Diplodacus signatifer: May, 1963: 42, 49.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); Tryon's type specimens.

LOCATION OF TYPES: Lectotype ♀ (D.3135) and 1 paralectotype ♀ (D.3135) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: The eastern coastal rainforests of Queensland, north from Bowen (type locality).

NEW RECORDS: Torres Strait islands: Yam I., 23.iii.1985, J. Turner; Stephens I., 26.v.1985, J. Rhodes. Northern Territory: Fogg Dam, near Darwin and Cobourg Peninsula, December 1984,

A. Allwood. All attracted to bacteria bait in Plant Quarantine Survey.

DIAGNOSIS

Medium sized pale coloured species; large circular black facial spots present; humeral and notopleural calli yellow; mesonotum orange-brown, mesopleural stripe of medium width reaching almost to anterior npl. bristle, lateral and medial postsutural vittae present, scutellum yellow; legs with all segments fulvous; wing with a narrow fuscous costal band and pale fuscous anal streak, costal cells pale fuscous, microtrichia in outer corner of second costal cell only; abdomen with all terga orange-brown except fulvous along posterior margin of tergum II and a large oval black spot posterocentrally on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.53 times breadth; fulvous without dark markings; anteromedial hump covered by a large number of short pale setae; orbital bristles red-brown to black: 2 i.or., s.or. usually absent; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with large circular black spots; length of face 0.45 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of short pale bristles. Antennae with all segments fulvous; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.60 mm.

Thorax mesonotum and pleural areas orange-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, ending just before anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices orange-brown); anterior 3/5 lower hypopleural calli (remainder orange-brown); 2 lateral postsutural vittae of medium width beginning anterior to mesonotal suture and narrowing posteriorly to end before upper pa. bristles; medial postsutural vitta of medium width, rounded posteriorly at a point level with lower pa. bristles and narrowing to a point anteriorly to end anterior to mesonotal suture. Postnotum orange-brown. Scutellum yellow with a broad orange-brown basal band. Bristles: sc. 2 or 4; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black (occasionally 1 pa. weak and pale red-brown).

Legs all segments fulvous; mid tibiae each with an apical black spur.

Wings length 5.2 mm; costal cells pale fuscous (second cell usually paler than first); microtrichia in outer corner of second costal cell only; remainder of wings colourless or with a pale fuscous tint except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and widening slightly apically to end between extremities of R_{4+5} and M, narrow pale fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga orange-brown except a broad transverse fulvous band across posterior margin of tergum II but not reaching lateral margins and a large oval black spot posterocentrally on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, conical in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.66:1. Apex of piercer rounded at tip with 4 pairs of subapical bristles (Fig. 338). Spicules at distal end of middle segment of medium width with 5–7 short broad dentations of uneven length (Fig. 339).

HOST PLANTS

NEW RECORD: In association with *B. barringtoniae* (Tryon) from *Barringtonia calyptata* (Barringtoniaceae), Gordonvale rainforest, north Queensland, 24.i.1977, B. McCulloch.

ATTRACTANT: No known record.

COMMENTS

B. signatifera is similar to *B. (Papuodacus) neopallescens* in possessing a red-brown mesonotum with lateral and medial postsutural vittae (lateral vittae beginning anterior to mesonotal suture), abdominal terga mostly orange-brown, wings colourless except for costal band and anal streak. It differs in having pale fuscous costal cells, facial spots large and circular, lateral postsutural vittae ending before upper pa. bristles and prsc. bristles always absent.

Originally, Tryon (1927) listed two females (in QM) as "types". They are in poor condition and each has a white label marked "TYPE D/3135". I designate 1 specimen (labelled "LECTOTYPE,

R. Drew") as lectotype and the other paralectotype.

Heminotodacus, n. subgen.

Bactrocera (Heminotodacus) dissidens, n. sp. (Fig. 340)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Stony logging area, Bulolo, under leaf of *Musa* sp., 1.viii.1979, H. Ivagai.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♀, Upper Stony logging area, Bulolo, under leaf of *Bambusa* sp., 27.vii.1979, H. Roberts; 1 ♂, Upper Stony logging area, Bulolo, under leaf of shrub, 10.viii.1979, H. Ivagai.

LOCATION OF TYPES: Holotype (T.10571) in QM; 2 paratypes in DPI.

DISTRIBUTION

Known only from Bulolo, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous without dark facial spots; humeral and notopleural calli yellow and connected by a broad yellow band; mesonotum shining black, lateral postsutural vittae present, mesopleural stripe broad and reaching to anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, a broad fuscous band across centre of wing from R_{4+5} to hind margin and a narrow fuscous band across base of wing joining with anal streak, first costal cell pale fuscous and second costal cell with a pale fuscous tint, microtrichia in outer corner of first costal cell and along anterior $\frac{1}{2}$ – $\frac{3}{4}$ of second costal cell; all abdominal terga orange-brown with a medial longitudinal fuscous band, apex of aculeus with 2 pairs of subapical lobes.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons of even width, length 1.55 times breadth; fulvous without dark markings; anteromedial hump with a small number of short dark setae; orbital bristles well developed and black: 1 s.or., 3–4 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with no dark spots; length of face 0.43 mm. Genae fulvous, dark subocular spot absent; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 3–4 well developed black bristles and a large number of smaller pale bristles. Antennae with all segments fulvous; a well developed black dorsal bristle on segment 2; arista

black (fulvous basally); length of segments: 0.10 mm; 0.25 mm; 0.58 mm.

Thorax mesonotum shining black except brown along mesonotal suture, below and behind lateral postsutural vittae. Pleural areas shining black except red-brown below humeral calli and fuscous above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; a broad yellow band connecting humeral and notopleural calli; 2 broad parallel sided lateral postsutural vittae ending just behind upper pa. bristles; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black). Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; hm. 1; scp. 4; all bristles well developed and black except for the hm. bristles which are absent in the female specimen.

Legs all segments fulvous except hind tibiae with pale fuscous tint on basal $\frac{2}{3}$; mid tibiae each with an apical black spur; fore femora with rows of long pale setae on dorsal surfaces.

Wings length 5.1 mm; first costal cell pale fuscous, second costal cell with a pale fuscous tint; microtrichia in outer corner of first costal cell and along anterior $\frac{1}{2}$ – $\frac{3}{4}$ of second costal cell; remainder of wings colourless except for a fuscous subcostal cell, narrow pale fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M , a broad fuscous transverse band running from R_{4+5} to hind margin and enclosing both crossveins, a narrow transverse fuscous band running from junction of R_{2+3} and R_{4+5} to anal streak, a broad fuscous anal streak reaching to wing margin, a diffuse pale fuscous tint in apex of wing around M ; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga orange-brown except for a medial longitudinal diffuse fuscous band over all terga but interrupted at intersegmental lines. A pair of orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Tip of piercer strongly sclerotized,

orange-brown with 2 pairs of subapical lobes (Fig. 340A). Ratio of length of oviscape to length of tergum V 0.92:1.

ATTRACTANT: No known record.

COMMENTS

B. dissidens is distinct in having humeral bristles, face without dark spots, a yellow band joining humeral and notopleural calli, a broad but incomplete transverse band across wing from R_{4+5} to hind margin and a narrow pale fuscous mark across apex of wing.

Hemiparatridacus, n. subgen.

Bactrocera (Hemiparatridacus) *abdoaurantiaca*, n. sp. (Fig. 341)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Eastern Highlands District: Aiyura (1650 m), hand collected on maize plant, 3.iii.1958, J.H. Barrett.

Paratype, PAPUA NEW GUINEA, Eastern Highlands District: 1 ♀, collected on maize plant, Aiyura (1650 m), 3.iii.1958, J.H. Barrett.

LOCATION OF TYPES: Holotype (T.10572) in QM; paratype in DPI.

DISTRIBUTION

Known only from Aiyura, Eastern Highlands District, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous without dark spots; humeral and notopleural calli yellow; mesonotum black, lateral and medial postsutural vittae present, broad mesopleural stripe reaching to anterior npl. bristle, scutellum yellow; wing with a narrow pale fuscous costal band and broad pale fuscous anal streak, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga III–V pale orange-brown with no dark markings, pecten absent on tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.44 times breadth; fulvous with no dark markings; anteromedial hump covered with a large number of short pale setae; orbital bristles dark fuscous: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with no dark spots; length of face 0.55 mm. Genae fulvous, pale subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a small number of well

developed pale bristles. Antennae with all segments fulvous; a well developed pale dorsal bristle on segment 2; arista fuscous (fulvous basally); length of segments: 0.15 mm; 0.28 mm; 0.75 mm.

Thorax mesonotum black except for a medial longitudinal dark red-brown pattern anterior to mesonotal suture. Pleural areas black except fuscous below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; 2 moderately broad parallel sided lateral postsutural vittae beginning as a spot anterior to mesonotal suture and ending behind upper pa. bristles; a broad medial postsutural vitta, rounded posteriorly at level of pa. bristles and narrowing to a point anteriorly at level of mesonotal suture; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black). Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 4; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles are well developed and dark fuscous.

Legs all segments fulvous; mid tibiae each with an apical black spur; fore femora with a row of long pale setae on dorsal surface.

Wings length 6.7 mm; costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only, remainder of wings colourless except for a fuscous subcostal cell, narrow pale fuscous costal band slightly overlapping R_{2+3} and ending between extremities of R_{4+5} and M, a broad pale fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten absent on tergum III. Tergum I wider than long, sterna I and II slightly longer than wide. Tergum I fuscous; tergum II pale orange-brown except dark fuscous across anterior $\frac{1}{2}$ and ending before lateral margins. Terga III–V pale orange-brown with no dark markings. A pair of oval pale orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: Ovipositor basal segment red-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1:1.

ATTRACTANT: No known record.

COMMENTS

B. abdoaurantiaca is a unique species in having

face without spots, black mesonotum with medial and lateral postsutural vittae (the latter beginning anterior to mesonotal suture), prsc. bristles absent, abdominal terga III–V uniformly pale orange-brown and pecten on abdominal tergum III absent.

Subgenus *Javadacus* Hardy

Bactrocera (*Javadacus*) *aberrans* (Hardy), n. comb. (Figs 342–344)

Dacus (*Afrodacus*) *aberrans* Hardy, 1951: 118–20; Hardy, 1955a: 5, 10.

Afrodacus mesoniger May, 1951: 8–10, 1963: 49, 70–1. New synonymy based on a study of a paratype of *D. aberrans* and the holotype and paratypes of *A. mesoniger*. Hardy (1956) discussed the dating of the 2 original descriptions.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION); the type series of *A. mesoniger* and a paratype of *D. aberrans*. LOCATION OF TYPES: *D. aberrans*, holotype ♂ in NMNH; *A. mesoniger*, holotype ♀ (T.5264) in QM.

DISTRIBUTION

Known from rainforests in coastal and subcoastal Queensland from Cairns and Atherton in the north to Toowoomba, Mt Glorious and Cunningham's Gap in the south; type locality, Lake Barrine, Queensland.

DIAGNOSIS

Medium sized species; face with small to medium sized black spots; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown with a broad medial longitudinal black band, pale fuscous laterally on terga III and IV, black anterolaterally on tergum V and a narrow transverse black band across base of tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.52 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with small to medium sized circular black spots;

length of face 0.45 mm. Genae fulvous; red-brown to black bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–6 small bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.68 mm.

Thorax mesonotum black with brown markings as follows: below and behind lateral postsutural vittae, around mesonotal suture, between humeral and notopleural calli, inside humeral calli. Pleural areas black except red-brown above mid coxae and below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae narrowing posteriorly to end before level of lower pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae pale fuscous; all other segments fulvous except hind tibiae fuscous; mid tibiae each with an apical black spur.

Wings length 5.0 mm; costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and widening slightly in apex of wing to end between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I black; tergum II orange-brown with a narrow transverse dark fuscous band across centre of tergum and expanding to cover lateral margins; terga III–V orange-brown with dark markings as follows: a narrow transverse black band across base of tergum III, a broad medial longitudinal black band over all 3 terga, pale fuscous laterally on terga III and IV, anterolateral corners of tergum V black. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense

aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ovicape to length of tergum V 0.68:1. Apex of piercer broad, narrowing sharply to a rounded tip, 4 pairs of subapical bristles (Fig. 343). Spicules at distal end of middle segment narrow, triangular, occasionally with 2 dentations (Fig. 344).

HOST PLANTS: Hardy (1951) and May (1953) recorded different species of *Litsea* as the hosts of their respective species. They are now synonymised (Queensland Herbarium Botanists, pers. comm.). *Neolitsea involucrata* does not occur in Australia (Queensland Herbarium Records) and therefore this record (May 1953) must be in error.

ATTRACTANT: No known record.

COMMENTS

B. aberrans has the posterior lobe of surstylus long, posterior margin of abdominal sternum V with a slight concavity, sa. bristles absent, mesonotum black, abdominal terga III–V orange-brown with a black “T” and darkening on lateral margins, and wings colourless with a costal band and anal streak.

Bactrocera (Javadacus) melanothoracica, n. sp. (Fig. 345)

TYPE SPECIMENS

Holotype ♂, TORRES STRAIT: Yam I., attracted to methyl eugenol, 21.vi.1977, R. Paton.

Paratypes, TORRES STRAIT: 23 ♂♂, Yam I., 21.vi.1977, R. Paton; 5 ♂♂, Yam I., 11.ii.1980, G. Sanewski; 1 ♂, Badu I., 21.vi.1977, R. Paton. QUEENSLAND: 1 ♂, Bamaga, 19–21.vi.1977, R. Paton; 1 ♂, Iron Range, 25 km SW Lockhart, 14–21.iv.1977, R.I. Storey; 1 ♂, Gordon's Mine Area, Iron Range, 12–18.ii.1976, G.B. Monteith; 1 ♂, ABRs Area 3, Captain Billy Creek, 5–12.ii.1976, G.B. Monteith. All paratypes attracted to methyl eugenol.

LOCATION OF TYPES: Holotype (T.10573) and 4 paratypes (T.10574–T.10577) in QM; 8 paratypes in ANIC; 2 paratypes in BMNH; 19 paratypes in DPI.

DISTRIBUTION

Recorded from the Torres Strait islands: Yam and Badu; Queensland: Bamaga, Iron Range and Captain Billy Creek (near Shelburne Bay).

DIAGNOSIS

Medium sized species; medium sized circular facial spots present; humeral and notopleural calli yellow; mesonotum black, lateral postsutural vittae

present, medial postsutural vitta absent, mesopleural stripe broad reaching anterior npl. bristle, scutellum yellow with a narrow black basal band; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells with a pale fulvous tint, microtrichia in outer corner of second costal cell only; abdominal terga III–V mostly orange-brown except for a medial longitudinal black band of medium width over all 3 terga, pale fuscous along anterior margin of tergum III and extending around lateral margins of all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.7 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter without short setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized circular black spots; length of face 0.45 mm. Genae fulvous, large brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 3–5 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.20 mm; 0.30 mm; 0.80 mm.

Thorax mesonotum black except broad red-brown lateral margins which enclose lateral postsutural vittae and continue inside humeral calli. Pleural areas red-brown except fuscous behind mesopleural stripe, dark fuscous to black along anterior margin of mesopleural stripe and on sternopleuron. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe reaching anterior npl. bristle dorsally, continuing to sternopleuron as transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior 3/5 lower hypopleural calli (remainder black); 2 narrow lateral postsutural vittae narrowing slightly posteriorly to end before the upper pa. bristles. Postnotum black, red-brown medially. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.3 mm; costal cells with a pale fulvous tint and microtrichia in outer corner of second costal cell only; remainder of wings

colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I orange-brown except for a medial longitudinal dark fuscous spot on posterior $\frac{1}{2}$ and dark fuscous patches laterally; tergum II orange-brown except for an elongate dark fuscous spot anteromedially and fulvous along posterior margin; terga III–V mostly orange-brown except for a medial longitudinal black band over all 3 terga beginning posterior to anterior margin of tergum III and ending before posterior margin of tergum V, pale fuscous along anterior margin of tergum III and continuing around lateral margins of terga III, IV and V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus elongate, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. melanothoracica is similar to *B. aberrans* (Hardy) in possessing a black mesonotum, colourless wings except for costal band and anal streak, humeral and notopleural calli yellow, scutellum yellow, medial postsutural vitta absent and lateral postsutural vittae present. It differs from this species in having the costal band overlapping R_{2+3} , broader mesopleural stripes reaching to the anterior npl. bristles, abdominal tergum III without a transverse black band across anterior margin. It is also similar to *B. endiandrae* (Perkins and May) in general wing and body colour patterns but differs in lacking the sa. bristles and in having the posterior lobe of the surstylus long and the mesopleural stripes broader.

Bactrocera (Javadacus) unirufa, n. sp. (Fig. 346)

TYPE SPECIMEN

Holotype ♂, AUSTRALIA, Queensland: Bellenden Ker Range (100 m), attracted to methyl eugenol, 17–24.x.1981, G.B. Monteith.

LOCATION OF TYPE: Holotype (T.10578) in QM.

DISTRIBUTION

Known only from Bellenden Ker Range, Queensland.

DIAGNOSIS

Medium sized species; medium sized circular

black facial spots present; humeral and notopleural calli yellow; mesonotum basically red-brown with a pattern of fuscous markings, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous, microtrichia in outer corner of second costal cell only; abdominal terga III–V uniformly red-brown without dark markings.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons narrowing slightly posteriorly, length 1.5 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with medium sized circular black spots; length of face 0.4 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 3–4 well developed red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.28 mm; 0.73 mm.

Thorax mesonotum red-brown except for 2 irregularly shaped broad posterolateral fuscous markings and smaller fuscous to pale fuscous markings on anterior area. Pleural areas fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices dark fuscous); anterior 3/5 lower hypopleural calli (remainder dark fuscous); 2 narrow lateral postsutural vittae narrowing posteriorly to end well before upper pa. bristles. Postnotum fuscous tending red-brown centrally. Scutellum yellow except for narrow fuscous basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown.

Legs all segments fulvous except fore and mid tibiae pale fuscous and hind tibiae fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 5.2 mm; costal cells pale fuscous; microtrichia in outer corner of second costal cell only; remainder of wings colourless except for fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I red-brown except fuscous across anterior $\frac{1}{2}$; tergum II red-brown except fulvous along posterior margin; terga III–V uniformly red-brown without dark markings. A pair of oval red-brown shining spots on tergum V. Posterior lobe of surstylus elongate, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. unirufa is similar to the other 2 South Pacific species of subgenus *Javadacus*, i.e. *B. aberrans* (Hardy) and *B. melanothoracica* in possessing colourless wings except for costal band and anal streak, humeral and notopleural calli yellow, medial postsutural vitta absent and lateral postsutural vittae present. It differs from these species in having the mesonotum basically red-brown and abdominal terga III–V uniformly red-brown without dark markings.

Niuginidacus, n. subgen.

Bactrocera (Niuginidacus) singularis, n. sp. (Fig. 347)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Kunai Creek, Mt Kaindi (1450 m), attracted to cue lure, 25.v.1981, A. Allison.

Paratypes, PAPUA NEW GUINEA, Morobe Province, Mt Kaindi: 1 ♂, Kunai Creek (1450 m), 29.xii.1980; 1 ♂, Pitpit Gully (1550 m), 8.vi.1981; 2 ♂♂, Lower Namie Creek (1600 m), 18.iii.1980 and 8.vi.1980; 1 ♂, Namie Creek (1650 m), 15.vi.1981; 1 ♂, Wau, 1.xii.1980; all attracted to cue lure by A. Allison.

LOCATION OF TYPES: Holotype (T.10579) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 4 paratypes in DPI.

DISTRIBUTION

Known only from Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous without facial spots; humeral and notopleural calli yellow;

mesonotum black, broad medial postsutural vitta present, lateral postsutural vittae absent, mesopleural stripe broad reaching just anterior to anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and anal streak, fuscous colouration enclosing r-m crossvein and continuing into discoidal cell, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-brown except for pale fuscous to fuscous anterolaterally on terga III and IV, a medial longitudinal black vitta on tergum V and pecten absent on tergum III.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.1 mm. Frons narrowing slightly posteriorly, length 1.47 times breadth; fulvous without dark markings; anteromedial hump with a small number of short pale setae; orbital bristles red-brown: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with no dark spots; length of face 0.45 mm. Genae fulvous, subocular spot and bristle absent. Occiput red-brown, fulvous along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 fulvous; segment 3 pale fuscous; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.58 mm.

Thorax mesonotum black. Pleural areas black except dark fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe reaching just anterior to anterior npl. bristle dorsally, continuing to sternopleuron as a round spot, anterior margin convex; a very broad medial postsutural vitta broadly rounded posteriorly at level of upper pa. bristles and narrowing to end just anterior of mesonotal suture; upper hypopleural calli (except broad black margin adjacent to postnotum); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black). Lateral postsutural vittae absent. Postnotum black, tending dark fuscous centrally. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles weak and red-brown to fuscous.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except apical 4 segments of all tarsi fuscous; mid tibiae each with an apical black spur.

Wings length 4.9 mm; costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; remainder of wings colourless except for dark fuscous subcostal cell, narrow fuscous costal band confluent with R₂₊₃ and

ending between extremities of R₄₊₅ and M, fuscous enclosing r-m crossvein and continuing into discoidal cell as an indefinite spot of colour, a narrow fuscous anal streak ending at wing margin; no dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe strong.

Abdomen elongate-oval; terga free; pecten absent on tergum III. Tergum I wider than long, sterna I and II slightly longer than wide. All terga orange-brown except pale fuscous to fuscous on anterior and lateral areas of terga I and II and anterolaterally on terga III and IV, a medial longitudinal black band on tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long and stout, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. singularis is distinct in having posterior lobe of surstylus long, abdominal sternum V with a slight concavity on posterior margin, 2 sc. bristles, prsc. bristles absent, pecten on abdominal tergum III absent, mesonotum black with lateral postsutural vittae absent and medial postsutural vitta present, wing with infuscation along r-m crossvein expanding over part of discoidal cell and abdomen elongate-oval.

Subgenus *Papuodacus* Drew

Bactrocera (*Papuodacus*) *neopallescentis*, n. nom. (Fig. 348)

Not *Dacus* (*Afrodacus*) *aberrans pallescentis* Hardy, 1955a: 5-6.

Dacus (*Hemizeugodacus*) *pallescentis* Drew, 1971: 44-6.

Dacus (*Papuodacus*) *pallescentis*: Drew, 1972a: 13.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6936) in QM.

DISTRIBUTION

Known only from Bisianumu, Ninoa Estate and Konedobu (type locality), Central Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots very small and pale or absent; humeral and notopleural calli yellow; mesonotum pale red-brown without dark markings, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, medial postsutural vitta present, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells

colourless with microtrichia in outer corner of second costal cell only; abdominal terga pale orange-brown except for a small dark fuscous spot centrally on posterior margin of tergum V.
ATTRACTANT: Cue lure.

COMMENTS

B. neopallescentis is similar to *B. atrisetosa* (Perkins) and *B. trichota* (May) in possessing a red-brown mesonotum, lateral and medial postsutural vittae present, legs fulvous and abdominal terga orange-brown but differs in lacking sa. bristles and fuscous markings on mesonotum and in having colourless costal cells. *Dacus pallescentis* Drew is preoccupied in *Dacus* by *Dacus aberrans pallescentis* Hardy and must be treated as a primary homonym even though it is transferred to *Bactrocera* (see Articles 57(a) and 57(b) of the International Code of Zoological Nomenclature).

Subgenus **Paradacus** Perkins

Bactrocera (Paradacus) aurantiventer, n. sp. (Fig. 349)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Missim (1200 m), attracted to cue lure, 16.iv.1981, A. Allison.

LOCATION OF TYPE: Holotype (T.10580) in QM.

DISTRIBUTION

Known only from Mt Missim, Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots absent; humeral and notopleural calli yellow; mesonotum black, lateral and medial postsutural vittae present, mesopleural stripe of medium width reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells with a very pale fulvous tint and microtrichia absent; abdominal terga II–V orange-brown without dark markings.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.3 mm. Frons narrowing slightly posteriorly, length 1.3 times breadth; fulvous without dark markings, anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous without dark markings; length of face 0.45 mm. Genae fulvous,

subocular spot absent; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 4–5 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a weak fulvous dorsal bristle on segment 2; length of segments: 0.13 mm; 0.23 mm.

Thorax mesonotum black except brown below and behind lateral postsutural vittae, above mesopleural suture and inside humeral calli. Pleural areas black except red-brown below humeral calli and above mid coxae. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe reaching anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior $\frac{3}{4}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width beginning anterior to mesonotal suture and narrowing slightly posteriorly to end before upper pa. bristles; a very broad medial postsutural vitta rounded posteriorly at level of upper pa. bristles and narrowing to a point anterior to mesonotal suture. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 4; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous; rows of long black setae on dorsal surfaces of fore femora.

Wings length 5.6 mm; costal cells with a very pale fulvous tint, microtrichia absent; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I fuscous; terga II–V orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus very long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. aurantiventer is similar to *B. citroides* in having clear wings except for costal band and anal streak, lateral and medial postsutural vittae present and abdominal terga uniformly orange-brown but differs in having a black mesonotum and the humeral and notopleural calli not joined by a lateral yellow band.

***Bactrocera (Paradacus) citroides*, n. sp.**
(Fig. 350)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Central Province: 51 km NW of Port Moresby on Moresby-Bereina road, attracted to cue lure, 26.vi.1980, R.A.I. Drew and D.W. Currey.
LOCATION OF TYPE: Holotype (T.10581) in QM.

DISTRIBUTION

Known only from the Central Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with large oval black spots; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum orange-brown; lateral and medial postsutural vittae present, mesopleural stripe of medium width reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga orange-brown with no dark markings.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.48 mm. Frons narrowing slightly posteriorly, length 1.42 times breadth; fulvous without dark markings; anteromedial hump with a large number of short pale setae; orbital bristles black: 1 s.or., 3 i.or.; all well developed except 1 i.or. reduced and pale on one side; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with large oval black spots not reaching epistoma; length of face 0.5 mm. Genae fulvous, small dark subocular spot present; dark fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 2-3 well developed dark bristles. Antennae with all segments fulvous; arista black (fulvous basally); length of segments 0.10 mm; 0.23 mm; 0.75 mm.

Thorax mesonotum and pleural areas orange-brown with no dark markings. Yellow markings as follows: humeral calli; notopleural calli; broad band connecting humeral and notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin convex; 2 lateral postsutural vittae beginning anterior to mesonotal suture and narrowing slightly posteriorly to end at upper pa.

bristles; a broad medial postsutural vitta rounded posteriorly at level of upper pa. bristles and narrowing to a point anteriorly at level of mesonotal suture; upper hypopleural calli (posterior apices orange-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder orange-brown). Postnotum orange-brown. Scutellum yellow except for narrow orange-brown basal band. Bristles: sc. 4; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp 4; all bristles well developed and black.

Legs all segments fulvous; mid tibiae each with an apical black spur; fore femora with a row of long pale setae on dorsal surface.

Wings length 5.9 mm; costal cells with a pale fuscous tint; microtrichia in outer corner of second costal cell only; remainder of wings colourless except for a fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending just beyond extremity of R_{4+5} , a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II slightly wider than long. All terga orange-brown with no dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. citroides is similar to *B. aurantiventer* in possessing clear wings except for costal band and anal streak, lateral and medial postsutural vittae present and abdominal terga uniformly orange-brown but differs in having the mesonotum uniformly orange-brown and the humeral and notopleural calli joined by a lateral yellow band.

Bactrocera (Paradacus) decipiens
(Drew), n. comb. (Figs 351-353)

Dacus (Paradacus) decipiens Drew, 1972a: 13-15.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♀ (T.6987) in QM.

DISTRIBUTION

Keravat, New Britain (type locality).

DIAGNOSIS

Large species; medium sized fuscous to black facial spots present; humeral and notopleural calli

yellow; mesonotum red-brown with 2 broad lateral longitudinal fuscous bands, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a broad pale fuscous costal band and anal streak, an irregular recurved pale fuscous marking across wing, costal cells extremely pale fuscous (second cell paler in centre), microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga I–V fulvous except for broad lateral fuscous margins on tergum I and a narrow medial longitudinal fuscous band on tergum V.

DESCRIPTION

FEMALE: Ovipositor apex of piercer with a large pair of subapical keels and with 4 pairs of subapical bristles (Fig. 352). Spicules at distal end of middle segment of medium width with 7–11 narrow, elongate dentations of uneven length (Fig. 353).

ATTRACTANT: No known record.

COMMENTS

B. decipiens was described adequately by Drew (1972a). It is similar to *B. perplexa* (Walker) in possessing infuscation on wings in addition to costal band and anal streak but differs in having an irregular S-shaped pale fuscous marking across wing, microtrichia in outer $\frac{1}{3}$ of second costal cell only, mesopleural stripe not extending to humeral callus, abdominal terga mostly orange-brown with broad lateral fuscous margins on tergum I, a narrow medial longitudinal fuscous band on tergum V and apex of piercer of ovipositor with 1 pair of subapical lobes.

Bactrocera (Paradacus) perplexa (Walker), n. comb. (Fig. 354)

Dacus perplexus Walker, 1862: 14.

Paradacus perplexus: Perkins, 1939: 33–4.

Dacus (Paradacus) perplexus: Hardy and Adachi, 1954: 156–7; Hardy, 1959: 180; Drew, 1973: 13–15.

MATERIAL EXAMINED

Syntype ♀, Gilolo, Moluccas, labelled "*Dacus implexus*" in Walker's handwriting and listed as probably Walker's type by Hardy (1959).

LOCATION OF TYPES: Syntype ♀ in NMV; 1 ♂ labelled "type"; "East Indies, Gilolo, W.W. Saunders, B.M. 1868-4" in BMNH (not a type, see COMMENTS under *B. curvifera*).

DISTRIBUTION

Gilolo, Indonesia (type locality).

DIAGNOSIS

Large species; large black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with a pattern of fuscous markings, mesopleural stripe reaching to humeral callus, lateral postsutural vittae beginning anterior to mesonotal suture, medial postsutural vitta present, scutellum yellow; wing with a broad fuscous costal band and moderately broad fuscous anal streak, infuscation along r–m crossvein and a V-shaped fuscous band across wing, costal cells pale fuscous, microtrichia covering most of second costal cell only; abdominal terga orange-brown except fuscous lateral margins on tergum I and a narrow transverse fuscous band along anterior margin of tergum II which ends before fuscous anterolateral margins and a narrow medial longitudinal fuscous band on terga III–V.

ATTRACTANT: No known record.

COMMENTS

B. perplexa was described adequately by Drew (1973). It is similar to *B. decipiens* (Drew) in possessing infuscation across wings in addition to costal band and anal streak but differs in having a broad U-shaped fuscous band across wing, microtrichia covering most of second costal cell, mesopleural stripe extending to humeral callus, abdominal terga orange-brown with a narrow transverse fuscous band across anterior margin of tergum II and on anterolateral corners of this tergum and apex of piercer of ovipositor needle shaped.

Subgenus **Paratridacus** Shiraki

***Bactrocera (Paratridacus) alampeta*, n. sp.** (Fig. 355)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Western Highlands District: Kuk Agriculture Research Station, Mt Hagen, attracted to methyl eugenol, 30.xii.1980, B. Thistleton.

LOCATION OF TYPE: Holotype (T.10582) in QM.

DISTRIBUTION

Known only from Mt Hagen, Western Highlands District, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots absent; humeral and notopleural calli yellow; mesonotum black with pale markings, lateral and medial postsutural vittae present, mesopleural stripe of medium width reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous

costal band and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for fuscous areas on lateral margins of tergum III and an irregular very narrow medial longitudinal pale fuscous band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.41 times breadth; fulvous with pale fuscous around orbital bristles, anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous without dark markings; length of face 0.48 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of weak pale bristles. Antennae with all segments fulvous; a weak pale dorsal bristle on dorsal segment 2; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.73 mm.

Thorax mesonotum black except dark fuscous below and behind lateral postsutural vittae and a narrow medial longitudinal fuscous band running from anterior end of medial postsutural vitta to anterior margin of mesonotum. Pleural areas dark fuscous except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior $\frac{3}{4}$ lower hypopleural calli (remainder black); 2 broad parallel sided lateral postsutural vittae beginning anterior to mesonotal suture and ending at upper pa. bristles; a medial postsutural vitta broadly rounded at prsc. bristles and narrowing to a point at level of mesonotal suture. Postnotum dark fuscous to black. Scutellum yellow except for narrow black basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black (scp. bristles particularly long).

Legs all segments fulvous except femora darker fulvous apically and hind tibiae pale fuscous basally; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.3 mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings with a very pale fulvous tint, fuscous subcostal cell, narrow fuscous costal band slightly overlapping R_{2+3} and ending

between extremities of R_{4+5} and M, narrow fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga free; pecten on tergum III absent. Tergum I and sterna I and II wider than long. Tergum I dark fuscous except for an irregular transverse orange-brown band across posterior margin; tergum II orange-brown except for a transverse dark fuscous band across anterior $\frac{1}{2}$ and ending before lateral margins; terga III–V orange-brown except for broad fuscous areas on lateral margins of tergum III, an irregular very narrow medial longitudinal pale fuscous band over terga III–V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. alampeta is similar to *B. atrisetosa* (Perkins) and *B. mesonotaita* in possessing colourless wings except for costal band and anal streak, humeral calli and scutellum entirely yellow, lateral and medial postsutural vittae present but differs in having a black mesonotum.

Bactrocera (Paratridacus) *atrisetosa* (Perkins), n. comb. (Figs 356–358)

Zeugodacus atrisetosus Perkins, 1939: 29–30.

Dacus (*Zeugodacus*) *papuaensis* Malloch, 1939b: 412–3; May, 1962a: 64 (syn.).

Melanodacus rubidus May, 1957b: 297–8; May, 1962a: 65 (syn.).

Melanodacus atrisetosus: May, 1962a: 64.

Dacus (*Paratridacus*) *atrisetosus*: Drew, 1973: 15–18.

MATERIAL EXAMINED

A large series of specimens in DPI and WEI (see DISTRIBUTION).

LOCATION OF TYPES: *Z. atrisetosus*, syntype ♀ in BMNH; *D. papuaensis*, holotype ♂ in NMNH; *M. rubidus*, holotype ♂ in QM.

DISTRIBUTION

Known only from Papua New Guinea (type localities Mafula, Mondo and Mt. Lamington) where it occurs at higher altitudes (1200 m–1650 m). Malloch (1939b) recorded a female of *D. cucumis* French from Mondo (1524 m), Papua, but

this was most likely an incorrect identification of a specimen of *B. atrisetosa*.

DIAGNOSIS

Medium sized species; small fuscous facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with irregularly shaped fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, medial postsutural vitta present, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells pale fulvous with microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdominal terga III–V orange-brown occasionally with fuscous on lateral margins of tergum III and generally with a narrow medial fuscous band on tergum V.

DESCRIPTION

FEMALE: Ovipositor basal segment red-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 1.2:1. Apex of piercer with 1 pair of small subapical keels; 5 pairs of subapical bristles (2 large and 3 small) close to apex (Fig. 357). Spicules at distal end of middle segment of medium width with 6–9 dentations, some broad and elongate and some small (Fig. 358).

ATTRACTANT: No known record.

COMMENTS

B. atrisetosa was described adequately by Drew (1973). It is similar to *B. mesonotaita* in possessing a red-brown mesonotum, lateral and medial postsutural vittae, humeral calli and scutellum yellow and wings colourless or with pale fuscous tint except for costal band and anal streak. It differs from this species in having the costal band narrow (just overlapping R_{2+3}), mesonotum red-brown with fuscous patterns, wings colourless, costal cells pale fulvous, abdominal terga III–V orange-brown except for a narrow medial longitudinal fuscous band on tergum V and lateral margins of tergum III fuscous.

Perkins (1939) described *B. atrisetosa* from 3 females but did not specify which specimen was the type. All 3 become syntypes.

Bactrocera (Paratridacus) coracinus (Drew), n. comb. (Fig. 359)

Dacus (Paratridacus) coracinus Drew, 1971: 46–8.

MATERIAL EXAMINED

Paratype σ in DPI.

LOCATION OF TYPE: Holotype σ (T.6937) in QM.

DISTRIBUTION

Bainyik, Sepik District, Papua New Guinea (type locality).

DIAGNOSIS

Small species; small black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe reaching to humeral callus, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad fuscous costal band and anal streak, a narrow transverse fuscous band across wing, first costal cell colourless, outer $\frac{1}{2}$ of second costal cell fuscous, microtrichia in $\frac{1}{3}$ of second costal cell only; all abdominal terga black except brown along posterior margin of tergum V.

ATTRACTANT: No known record.

COMMENTS

B. coracinus was described adequately by Drew (1971). It is distinct from the other species of subgenus *Paratridacus* in having a transverse fuscous band across the wing in addition to the costal band and anal streak.

Bactrocera (Paratridacus) expandens (Walker), n. comb. (Figs. 360–362)

Dacus expandens Walker, 1859: 114.

Bactrocera garciniae Bezzi, 1913: 97; Hardy, 1951: 140 (syn.).

Dacus yayeyamanus Matsumura, 1916: 412; Hardy, 1951: 140 (syn.).

Paratridacus expandens: Perkins, 1939: 33.

Dacus (Paratridacus) expandens: Hardy, 1951: 140–2; Drew, 1973: 18–19.

MATERIAL EXAMINED

Two $\sigma\sigma$ of *D. expandens* in BMNH; a series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: *D. expandens*, 2 $\sigma\sigma$ in BMNH (not types, see COMMENTS); *B. garciniae*, σ \varnothing syntypes in NMND; *D. yayeyamanus*, holotype \varnothing in HUS.

DISTRIBUTION

Known from eastern coastal Queensland, north from Cairns and Bainyik, Sepik District, Papua New Guinea; type locality, Aru Is. Hardy (1951) stated that the species is widely distributed having seen specimens from Japan, Philippine Is, Ceylon and India.

DIAGNOSIS

Large species; medium sized black facial spots

present; humeral and notopleural calli yellow; mesonotum red-brown with a mottled appearance due to areas of attachment of flight muscles, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae present, medial postsutural vitta absent, scutellum yellow; wing with a broad dark fulvous costal band and anal streak, costal cells dark fulvous, microtrichia in second costal cell and outer corner of first costal cell; abdominal terga III–V orange-brown except for a narrow fuscous spot on anterolateral corners of tergum III and a narrow medial longitudinal fuscous band over posterior $\frac{1}{2}$ of tergum IV and most of tergum V.

DESCRIPTION

FEMALE: Ovipositor apex of piercer with 2 very large subapical keels midway between gonopore and apex; 4 pairs of small subapical bristles (Fig. 361). Spicules at distal end of middle segment of medium width with 3–5 dentations, 1 long and broad centrally and remainder small (Fig. 362).

HOST PLANTS

NEW RECORD: *Garcinia dulcis* (Guttiferae), Cairns Botanical Gardens, 13.iii.1985, B. McCulloch.
ATTRACTANT: No known record.

COMMENTS

B. expandens was described adequately by Hardy (1951) and Drew (1973). It is similar to *B. atrisetosa* (Perkins) and *B. mesonotaita* in possessing a red-brown mesonotum, lateral postsutural vittae, humeral calli and scutellum yellow and wings colourless except for costal band and anal streak but differs in lacking the medial postsutural vitta.

Hardy (1959) indicated a male of *D. expandens* in BMNH as the type but Walker (1859) based his description on a female. Hardy (1959) and Perkins (1939) studied 2 separate males, both of which are in BMNH. 1 male labelled "*expandens*" in Walker's handwriting, "Borneo, Aru Is, W. Saunders, BM 1868-4", a green Walker type label added by BMNH staff, a circular label "Aru 28", plus a Hardy 1954 determination label; 1 male labelled "*expandens*" in Walker's handwriting, "Aru Island off New Guinea, A.R. Wallace, BM 1858-48", a circular label "Aru Is 58-48", a Perkins determination label. As discussed under *B. curvifera*, there appears to be no valid lectotype designation "by inference of holotype" and the males in BMNH should not be regarded as types.

Bactrocera (Paratridacus) mesonotaita, n. sp. (Fig. 363)

TYPE SPECIMEN

Holotype ♀, PAPUA NEW GUINEA, Sepik District: Bainyik, 13.i.1973, D. Sands.

LOCATION OF TYPE: Holotype (T.10583) in QM.

DISTRIBUTION

Known only from Bainyik, Sepik District, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with small irregularly oval black spots; humeral and notopleural calli yellow; mesonotum red-brown, lateral and medial postsutural vittae present, mesopleural stripe broad reaching midway between anterior npl. bristle and humeral callus, scutellum yellow; wing with a pale fuscous tint and a broad fuscous costal band and anal streak, costal cells pale fuscous, microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga II–V pale orange-brown except for a small area of pale fuscous anterolaterally on tergum III, aculeus with 1 pair of subapical lobes.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 2.13 mm. Frons narrowing slightly posteriorly, length 1.29 times breadth; fulvous without dark markings; anteromedial hump with a large number of short pale setae; orbital bristles black: 1 s.or., 5 i.or., well developed except for 2 small i.or. on 1 side; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small irregularly oval black spots; length of face 0.75 mm. Genae fulvous, small fuscous subocular spot present; a well developed dark fuscous bristle and a large number of smaller dark fuscous bristles present. Occiput fulvous, yellow along eye margins; occipital row with 12 well developed dark bristles and a large number of smaller pale bristles. Antennae with all segments fulvous except fuscous on apex of segment 3; a small pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.35 mm; 1.05 mm.

Thorax mesonotum red-brown with no dark markings. Pleural areas red-brown except fuscous above hind coxae. Yellow markings as follows: humeral calli; notopleural calli; broad mesopleural stripe, reaching midway between anterior npl. bristle and humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; 2 broad parallel sided lateral postsutural vittae beginning in a spot anterior to mesonotal suture and ending behind upper pa.

bristles; a broad medial postsutural vitta broadly rounded at level of prsc. bristles and narrowing to a point just anterior of mesonotal suture; upper hypopleural calli (posterior apices red-brown); anterior 5/7 lower hypopleural calli (remainder red-brown). Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black except scp. small and red-brown.

Legs all segments fulvous; mid tibiae each with an apical black spur; fore femora with a row of long pale setae on dorsal surface.

Wings length 9.0 mm; costal cells pale fuscous, microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings with a pale fuscous tint, fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and overlapping this vein at its extremity, broad fuscous anal streak ending at wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; pecten absent on tergum III; tergum I and sterna I and II slightly wider than long. Tergum I orange-brown with pale fuscous markings. Terga II–V pale orange-brown except tending whitish posteriorly on tergum II and a small area of pale fuscous anterolaterally on tergum III. A pair of oval orange-brown shining spots on tergum V. Basal segment of ovipositor orange-brown, dorsoventrally flattened and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 1:1. Apex of piercer with 1 pair of strong subapical lobes (Fig 363A).

ATTRACTANT: No known record.

COMMENTS

B. mesonotaita is similar to *B. atrisetosa* (Perkins) in possessing a red-brown mesonotum, lateral and medial postsutural vittae, humeral calli and scutellum yellow and wings colourless or with a pale tint except for costal band and anal streak. It differs from this species in having the costal band broad (confluent with R_{4+5}), mesonotum uniformly red-brown without fuscous patterns, costal cells pale fuscous, wings with a pale fuscous tint and abdominal terga II–V pale orange-brown with pale fuscous anterolaterally on tergum III.

Bactrocera (Paratridacus) *unichromata*, n. sp. (Fig. 364)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central District: 20 km SE of Port Moresby, hand swept off bushes, 1.i.1982, J.W. Ismay.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Mt Kaindi (1230 m), attracted to methyl eugenol, 2.iii.1981, A. Allison; 1 ♀, Wau, 21.xii.1972, O.W. Richards. LOCATION OF TYPES: Holotype (T.10584) in QM; 1 paratype in BMNH; 1 paratype in DPI.

DISTRIBUTION

Known from the Central District and Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with medium sized oval black spots present; humeral and notopleural calli yellow; mesonotum uniformly red-brown without dark markings, lateral and medial postsutural vittae present, lateral postsutural vittae beginning anterior to mesonotal suture, mesopleural stripe of medium width reaching midway between anterior margin of notopleural calli and anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga I–V uniformly orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of uniform width, length 1.4 times breadth; fulvous without dark markings, anteromedial hump covered by a large number of short dark setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized oval black spots; length of face 0.53 mm. Genae fulvous, no subocular spot present; fulvous bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of small pale to dark bristles. Antennae with all segments fulvous; arista black (fulvous basally); length of segments: 0.13 mm; 0.28 mm; 0.78 mm.

Thorax mesonotum and pleural areas uniformly red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; upper hypopleural calli (posterior apices red-brown); anterior 3/5 lower hypopleural calli (remainder red-brown); 2 moderately broad lateral postsutural vittae beginning anterior to mesonotal suture and narrowing slightly posteriorly to end just behind upper pa. bristles; a medial postsutural vitta of medium width broadly rounded posteriorly just anterior of prsc.

bristles and narrowing to a point anteriorly to end at level of mesonotal suture. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous; rows of long pale setae on dorsal surfaces of fore femora; mid tibiae each with an apical red-brown to fuscous spur.

Wings length 5.7 mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and narrowing apically to end just beyond extremity of R_{4+5} , a broad pale fuscous anal streak ending well before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen oval; terga free; no pecten on tergum III. Tergum I and sterna I and II wider than long. All abdominal terga orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 1:1. Apex of piercer with a pair of weak subapical keels.

ATTRACTANT: Methyl eugenol.

COMMENTS

B. unichromata is similar to *B. atrisetosa* (Perkins) and *B. mesonotaita* in possessing a red-brown mesonotum, lateral and medial postsutural vittae, humeral calli and scutellum entirely yellow and wings colourless except for costal band and anal streak. It differs from *B. atrisetosa* in having the costal band confluent with R_{4+5} and the mesonotum uniformly red-brown without dark patterns, and from *B. mesonotaita* in having the costal cells colourless, wings without a pale fuscous tint and abdominal terga I–V uniformly orange-brown.

Subgenus *Sinodacus* Zia

Bactrocera (*Sinodacus*) *abdopallescens* (Drew), n. comb. (Fig. 365)

Dacus (*Asiadacus*) *abdopallescens* Drew, 1971: 31–3.

Dacus (*Pacifodacus*) *abdopallescens*: Drew, 1972a: 12.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6929) in QM.

DISTRIBUTION

Known from several localities throughout the Morobe and Central Provinces, Papua New Guinea (type locality, Lumi, Sepik District).

DIAGNOSIS

Medium sized species; small elongate black facial spots present; humeral and notopleural calli yellow; mesonotum black, mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, medial postsutural vitta absent, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, first costal cell colourless to extremely pale fulvous, second costal cell pale fulvous, microtrichia in outer $\frac{1}{3}$ of second costal cell only; all abdominal terga generally orange-brown.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. abdopallescens was described adequately by Drew (1971). It is similar to *B. perpusilla* (Drew) in possessing clear wings except for costal band and anal streak, lateral postsutural vittae present and medial postsutural vitta absent but differs in having lateral postsutural vittae present and beginning anterior to mesonotal suture, no yellow band along anterior margin of mesonotal suture, mesonotum dull black with small brown markings and abdominal terga predominantly orange-brown.

Bactrocera (*Sinodacus*) *aneuvittata* (Drew), n. comb. (Fig. 366)

Dacus (*Asiadacus*) *aneuvittatus* Drew, 1971: 33–5.

Dacus (*Pacifodacus*) *aneuvittatus*: Drew, 1972a: 12.

MATERIAL EXAMINED

Holotype ♂, Sarramea, New Caledonia, December 1967, P. Cocherneau.

LOCATION OF TYPE: Holotype (T.6930) in QM.

DISTRIBUTION

New Caledonia (type locality, Sarramea).

DIAGNOSIS

Medium sized species; facial spots absent; humeral and notopleural calli yellow; mesonotum

rich red-brown with fuscous markings along posterior margin, mesopleural stripe equal in width to notopleural callus, lateral and medial postsutural vittae absent, broad yellow triangular marking above notopleural calli and running along anterior margin of mesonotal suture, scutellum yellow; wing with a broad dark fuscous costal band and anal streak, a broad dark fuscous band along r-m crossvein, costal cells fuscous, microtrichia covering both costal cells; abdominal terga III-V red-brown except broad fuscous lateral longitudinal bands on all 3 terga and a narrow medial longitudinal fuscous band running from centre of tergum II to posterior margin of tergum V.

ATTRACTANT: No known record.

COMMENTS

B. aneuittata was described adequately by Drew (1971). It is distinct from all other species of subgenus *Sinodacus* in having the postsutural vittae absent in addition to possessing a broad costal band expanding in apex of wing and a broad infuscation along r-m crossvein.

Bactrocera (Sinodacus) angusticostata, n. sp. (Fig. 367)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Eastern Highlands Province: Kassam Pass, attracted to cue lure, 19.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Eastern Highlands Province: 1 ♂, Kassam Pass, attracted to cue lure, 19.vi.1980, R.A.I. Drew and D. W. Currey. Western Highlands District: 1 ♂, 10.x.1978, 2 ♂♂, 30.x.1978, 1 ♂, 30.xi.1978, 1 ♂, 7.xii.1978, Kuk Agriculture Research Station, Mt Hagen, B. Thistleton, all attracted to Dak Pot trap. Morobe Province: 1 ♂, Mt Missim (1500 m), attracted to cue lure, 26.xi.1981, A. Allison.

LOCATION OF TYPES: Holotype (T.10585) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 5 paratypes in DPI.

DISTRIBUTION

Known from Eastern Highlands Province, Western Highlands District and Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots absent; humeral calli yellow; notopleural calli fuscous; mesonotum red-brown with dark markings, lateral and medial postsutural vittae present; mesopleural stripe broad almost reaching humeral callus, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells almost colourless, microtrichia in outer corner of second costal cell only; abdominal terga III-V orange-

brown with 2 broad lateral longitudinal glossy black bands over all 3 terga and a broad medial longitudinal glossy black band on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.2 mm. Frons narrowing slightly posteriorly, length 1.32 times breadth; fulvous with no dark markings; anteromedial hump covered by a small number of short dark setae; orbital bristles well developed and black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous, facial spots absent; length of face 0.43 mm. Genae fulvous, small fuscous subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of small, pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex; a red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.10 mm; 0.23 mm; 0.58 mm.

Thorax mesonotum red-brown with dark markings as follows: 2 lateral bands beginning at anterior margin enclosing scp. bristles and narrowing posteriorly before running at right angles along anterior margin of mesonotal suture; dark fuscous around notopleural calli; dark fuscous below pa. bristles; in some specimens there is a broad dark fuscous band enclosing inner scp. bristles and running to anterior end of medial longitudinal yellow postsutural vitta. Pleural areas red-brown except dark fuscous to black on sternopleuron, above hind coxae and on pteropleuron. Yellow markings as follows: humeral calli; broad mesopleural stripe reaching almost to humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; anterior $\frac{1}{2}$ of upper hypopleural calli (remainder dark fuscous); anterior $\frac{3}{4}$ lower hypopleural calli (remainder dark fuscous); a broad medial longitudinal postsutural vitta beginning just anterior to level of mesonotal suture and broadening posteriorly to end at level of upper pa. bristles; 2 narrow lateral postsutural vittae ending midway between sa. and upper pa. bristles. Notopleural calli fuscous. Postnotum black laterally, fuscous centrally. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent (in 3 specimens there is a single weak prsc. bristle present); pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous to black.

Legs all segments fulvous; mid tibiae each with an apical black spur.

Wings length 5.2 mm; first costal cell with a very pale fuscous tint, second costal cell colourless,

microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, very narrow fuscous costal band confluent with R_{2+3} and ending at extremity of M_1 , narrow pale fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I dark fuscous to black except for a broad transverse orange-brown band on posterior $\frac{1}{2}$ and narrowing at lateral margins; tergum II orange-brown except for a narrow transverse black band along anterior margin which broadens on lateral margins; terga III–V orange-brown except for 2 broad lateral longitudinal glossy black bands on all 3 terga which connect with a narrow transverse fuscous band along anterior margin of tergum III and a broad medial longitudinal glossy black band on tergum V. A pair of circular orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure (Dak Pot).

COMMENTS

B. angusticostata is similar to *B. paulula* in possessing a narrow costal band confluent with R_{2+3} , lateral and medial postsutural vittae present with lateral vittae beginning before mesonotal suture, yellow humeral and notopleural calli not joined by a lateral yellow band and wings colourless except for costal band and anal streak. It differs from this species in having the mesonotum red-brown with fuscous markings, abdominal terga III–V orange-brown with 2 broad lateral longitudinal black bands and a medial longitudinal band on tergum V.

Bactrocera (Sinodacus) buvittata, n. sp. (Fig. 368)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Central Province: 51 km NW of Port Moresby on Moresby–Bereina road, 26.vi.1980, attracted to cue lure, R.A.I. Drew and D.W. Currey.

Paratype, PAPUA NEW GUINEA, Central Province: 1 ♂, Brown River, attracted to Willison's lure, 3.iii.1970, T.L. Fenner.

LOCATION OF TYPES: Holotype (T.10589) in QM; paratype in DPI.

DISTRIBUTION

Known from the Central Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face black; humeral and

notopleural calli yellow and connected by a broad yellow band; mesonotum black, lateral and medial postsutural vittae present; mesopleural stripe broad but not reaching mesonotum dorsally, scutellum yellow; wing with a broad dark fuscous costal band, anal streak absent, costal cells pale fuscous, microtrichia in outer corner of second costal cell only; abdominal terga III–V fulvous with a medial longitudinal black band and narrow transverse black band along posterior margin of tergum V, fuscous oval shining spots.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.33 mm. Frons of even width, length 1.36 times breadth; fulvous with fuscous adjacent to lunule; anteromedial hump absent; bristles black: 1 s.or., 3 i.or.; lunule dark fuscous and continuing as a dark fuscous line down each side of face. Ocellar triangle fuscous. Vertex fulvous. Face black, length of face 0.43 mm. Genae fulvous, subocular spot absent; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of small fulvous bristles. Antennae with segments 1 and 2 dark fulvous, segment 3 absent on both specimens; a strong dark fulvous dorsal bristle on segment 2; length of segments: 0.13 mm; 0.25 mm.

Thorax mesonotum black tending dark brown anteriorly and below and behind lateral postsutural vittae. Pleural areas fulvous. Yellow marking as follows: humeral calli; notopleural calli; mesopleural stripe broad, reaching beyond anterior npl. bristle, continuing to sternopleuron as a large transverse spot, anterior margins strongly convex (there is a broad black margin below the mesopleural suture so that the mesopleural stripe does not extend dorsally to this suture — this character is unique in the Dacinae); upper hypopleural calli (posterior apices black); anterior $\frac{3}{4}$ lower hypopleural calli (remainder black); a large medial longitudinal postsutural vitta beginning at level of anterior npl. bristle and ending at posterior margin of mesonotum where it is broad and rounded; 2 broad parallel sided lateral postsutural vittae beginning anterior to mesonotal suture and ending behind upper pa. bristles; a broad band connecting humeral and notopleural calli. Postnotum black laterally, red-brown centrally. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 2; all bristles well developed and black.

Legs all segments fulvous; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells pale fuscous;

microtrichia in outer $\frac{1}{3}$ of second costal cell; remainder of wings colourless except for a dark fuscous subcostal cell and a broad dark fuscous costal band overlapping R_{4+5} for its entire length; anal streak reduced to a pale fuscous tint in basal portion of anal cell; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga free; pecten present on tergum III. All terga fulvous except for the following dark markings on tergum V: a medial longitudinal black band, a transverse black band along posterior margin, a pair of fuscous oval shining spots. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. buvittata is similar to *B. angusticostata* and *B. paulula* in possessing lateral and medial postsutural vittae and wings colourless except for costal band and anal streak. It differs from these species in having humeral and notopleural calli joined by a lateral yellow band, lateral postsutural vittae beginning anterior to mesonotal suture and costal band broad (overlapping R_{4+5} for entire length).

Bactrocera (Sinodacus) emarginata (Perkins), n. comb. (Fig. 369)

Neodacus emarginatus Perkins, 1939: 24.

Dacus (Neodacus) emarginatus: Hardy, 1954: 10.

Dacus (Pacifodacus) emarginatus: Drew, 1973: 8–10.

MATERIAL EXAMINED

Holotype ♂, Mondo (1500 m), Central District, Papua New Guinea, February 1934, L.E. Cheesman.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Mondo, Central District, Papua New Guinea (type locality).

DIAGNOSIS

Medium sized species; small fuscous facial spots present; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum generally black, mesopleural stripe equal in width to notopleural callus, lateral and medial postsutural vittae present, scutellum yellow; wing with a broad fuscous costal band and narrow fuscous anal streak, a large indefinite fuscous spot over apical $\frac{1}{2}$ of wing, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga II and III orange-brown, tergum

IV orange-brown with broad lateral fuscous margins joined by a fuscous band across posterior margin, tergum V fuscous with a narrow medial longitudinal black band.

ATTRACTANT: No known record.

COMMENTS

B. emarginata was described adequately by Drew (1973). It is similar to *B. strigifinis* (Walker) and *B. surrufula* in possessing lateral and medial postsutural vittae, humeral and notopleural calli joined by a lateral yellow band, wings infuscated in addition to costal band and anal streak and in lacking a yellow triangle above notopleural calli. It differs from *B. surrufula* in having the apical $\frac{1}{2}$ of wing lightly infuscated and abdominal terga basically red-brown. It differs from *B. strigifinis* in having lateral postsutural vittae short (beginning behind mesonotal suture and ending well before upper pa. bristle), a broad costal band confluent with R_{4+5} , apical $\frac{1}{2}$ of wing lightly infuscated, no infuscation along dm-cu crossvein, mesonotum basically black and abdominal terga II–IV orange-brown with posterior and lateral margins of tergum IV and all of tergum V fuscous.

Bactrocera (Sinodacus) paulula, n. sp. (Fig. 370)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Gumi-Watut, attracted to cue lure, 26.v.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂ (26.v.1980), 1 ♂ (30.v.1980), Gumi-Watut, P. Daur; 1 ♂, Mt Kaindi (2160 m), 16.vi.1980, A. Allison; 1 ♂, 15.vi.1980, 4 ♂, 16.vi.1980, Wau Ecology Institute (1400 m), R.A.I. Drew and D.W. Currey; 2 ♂, Kunai Creek, Mt Kaindi, 27.vii.1981; 1 ♂, Mt Kaindi (1650 m), 21.ix.1981, A. Allison. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10590) and 1 paratype (T.10591) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 6 paratypes in DPI.

DISTRIBUTION

Known only from the Morobe Province, Papua New Guinea.

DIAGNOSIS

Very small species; facial spots absent; humeral calli yellow; notopleural calli glossy black; mesonotum glossy black, lateral postsutural vittae very short, medial postsutural vitta present, mesopleural stripe broad almost reaching humeral callus, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells with a pale fuscous tint, microtrichia in outer corner of second costal cell only; abdominal terga

III–V orange-brown with a medial longitudinal and 2 broad lateral longitudinal glossy black bands.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 0.9 mm. Frons of even width, length 1.25 times breadth; fulvous, with or without pale fuscous on anteromedial hump, latter covered by short dark setae; orbital bristles small and black: 1 s.or., 3 i.or.; lunule fulvous to pale fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous, facial spots absent; length of face 0.3 mm. Genae fulvous, small fuscous subocular spot present; red-brown bristle present. Occiput red-brown with broad areas of fuscous, yellow along eye margins; occipital row with a large number of very small pale bristles. Antennae with segments 1 and 2 red-brown, segment 3 red-brown with pale fuscous on apex; a weak red-brown dorsal bristle on segment 2; arista black (red-brown basally); length of segments: 0.08 mm; 0.18 mm; 0.45 mm.

Thorax mesonotum glossy black. Pleural areas glossy black except red-brown between mesopleural stripe and fore coxae (there is a narrow band of glossy black below the humeral calli). Yellow markings as follows: humeral calli; broad mesopleural stripe, reaching almost to humeral callus dorsally, continuing to sternopleuron as a red-brown spot, anterior margin convex; upper hypopleural calli (posterior $\frac{1}{2}$ glossy black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder glossy black); a broad medial postsutural vitta beginning just anterior of mesonotal suture and ending at level of upper pa. bristles; 2 short, narrow lateral postsutural vittae ending at level of sa. bristles. Notopleural calli glossy black. Postnotum glossy black. Scutellum yellow except for narrow glossy black basal band. Bristles: sc. 2; prsc. absent (present but weak in holotype); pa 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black except inner scp. weak and pale.

Legs fore coxae fulvous, mid and hind coxae fuscous; all other segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 4.2 mm; costal cells very pale fuscous, microtrichia in extreme outer portion of second costal cell only, remainder of wings with a very pale fuscous tint, fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending at extremity of M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen oval; terga free; pecten present on tergum III. Terga I and II glossy black except

orange-brown centrally along intersegmental line and a transverse orange-brown band on posterior $\frac{1}{2}$ of tergum II which narrows laterally; terga III–V orange-brown with a medial longitudinal glossy black band narrow or absent on tergum III and broadening on terga IV and V and 2 broad lateral longitudinal glossy black bands. In some specimens there are narrow transverse black bands along anterior margins of terga III and V. A pair of small round orange-brown shining spots covered by a dense fine pubescence on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. paulula is similar to *B. angusticostata* in having humeral and notopleural calli not joined by a lateral yellow band, lateral and medial postsutural vittae present with lateral vittae beginning behind mesonotal suture, wings colourless except for costal band and anal streak and costal band confluent with R_{2+3} . It differs from this species in having a glossy black mesonotum, abdominal terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal black bands joined along anterior margin of tergum III.

Bactrocera (Sinodacus) perpusilla (Drew), n. comb. (Fig. 371)

Dacus (Asiadacus) perpusillus Drew, 1971: 42–4.

Dacus (Pacifodacus) perpusillus: Drew, 1972a: 12.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype σ (T.6934) in QM.

DISTRIBUTION

Noumea, New Caledonia (type locality).

DIAGNOSIS

Small species; facial spots absent; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to anterior npl. bristle, lateral and medial postsutural vittae absent, yellow triangle above notopleural calli and running along anterior margin of mesonotal suture, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells fuscous, microtrichia covering both costal cells; abdominal tergum III black, terga IV and V orange-brown except anterior $3/5$ of lateral margins of tergum IV and anterolateral corners of tergum V black and a

broad medial longitudinal black band over both terga.

ATTRACTANT: Cue lure.

COMMENTS

B. perpusilla was described adequately by Drew (1971). It is similar to *B. abdopallescens* (Drew) in having lateral postsutural vittae present, medial postsutural vitta absent and wings colourless except for costal band and anal streak but differs in having postsutural vittae absent, a triangular yellow band above each notopleural callus along anterior margin of mesonotal suture, mesonotum glossy black and abdominal terga black except for orange-brown areas on terga IV and V.

Bactrocera (Sinodacus) salamander (Drew and Hancock), n. comb. (Fig. 372)

Dacus (Pacifodacus) salamander Drew and Hancock, 1981: 51-4.

MATERIAL EXAMINED

One ♂ paratype in DPI.

LOCATION OF TYPE: Holotype ♂ (T.8220) in QM.

DISTRIBUTION

Bamaga, north Queensland (type locality).

DIAGNOSIS

Medium sized species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown to dark red-brown without dark markings, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae absent, medial postsutural vitta present, yellow triangle above notopleural calli and running along anterior margin of mesonotal suture, scutellum yellow; wing with a broad fuscous costal band and anal streak, a fuscous tint across the general wing membrane, costal cells fuscous, microtrichia covering second costal cell and most of first costal cell; abdominal terga III-V red-brown laterally and orange-brown centrally with a medial longitudinal red-brown stripe over all 3 terga.

ATTRACTANT: Cue lure.

COMMENTS

B. salamander was described adequately by Drew and Hancock (1981). It is similar to *B. triangularis* (Drew), *B. emarginata* (Perkins), *B. strigifinis* (Walker), *B. surrufula* and *B. univittata* (Drew) in possessing postsutural vittae and infuscation on wing in addition to costal band and anal streak. It differs from these species in having a yellow triangular marking above notopleural calli along

anterior margin of mesonotal suture and the humeral and notopleural calli not joined by a lateral yellow band.

***Bactrocera (Sinodacus) sepikae*, n. sp.** (Fig. 373)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, West Sepik Province: Eliptamin (5° 03'S, 141° 40'E), 1500 m, hand collected on *Cardamom* sp., 19.xi.1985, J.W. Ismay.

LOCATION OF TYPE: Holotype (T.10592) in QM.

DISTRIBUTION

Known only from the West Sepik Province, Papua New Guinea.

DIAGNOSIS

Small species; face with a pair of small pale spots; humeral and notopleural calli yellow and joined by a yellow band; mesonotum black, lateral and medial postsutural vittae present, mesopleural stripe extending to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture as a small spot, scutellum yellow; wing with a moderately broad fuscous costal band and anal streak, a broad U-shaped fuscous band across wing, costal cells colourless with microtrichia in outer 1/3 of second cell; abdominal terga III-V orange-brown with an elongate black spot in centre of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.1 mm. Frons of even width, length 1.2 times breadth; fulvous with a small pale fuscous patch on anteromedial hump; latter covered with a few short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with small pale fuscous spots; length of face 0.35 mm. Genae fulvous, fuscous subocular spot present; red-brown bristle present. Occiput fulvous ventrally, fuscous dorsally, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with pale fuscous on apex and outer surface; a strong dark dorsal bristle on segment 2; length of segments: 0.10 mm; 0.20 mm; 0.55 mm.

Thorax mesonotum black, tending dark fuscous along posterior margin and brown as follows: below and behind lateral postsutural vittae, inside humeral calli and as a broad medial longitudinal band running from anterior end of medial yellow vitta to anterior margin of mesonotum. Pleural

areas black except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; a broad yellow band connecting humeral and notopleural calli; a pair of very narrow lateral postsutural vittae beginning anterior to mesonotal suture and narrowing posteriorly to end before upper pa. bristles; a broad medial longitudinal vitta rounded posteriorly at level of upper pa. bristles and narrowing to a point anteriorly to end just anterior to mesonotal suture; a moderately broad mesopleural stripe extending to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices dark fuscous); anterior 3-5 lower hypopleural calli (remainder dark fuscous). Postnotum dark fuscous. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black except mpl. red-brown.

Legs all segments fulvous except hind tibiae tending pale fuscous basally; mid tibiae without an apical spur.

Wings length 4.9 mm; costal cells colourless with microtrichia covering apical 1/3 of second costal cell only; remainder of wings colourless except dark fuscous subcostal cell, moderately broad fuscous costal band confluent with R₄₊₅ except for a small area just distal of r-m crossvein and ending at apex of M, a broad U-shaped fuscous band across wing enclosing both crossveins but not joining with costal band apically, broad fuscous anal streak reaching wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe strong.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga uniformly orange-brown except for dark fuscous laterally on tergum I and anterolaterally on tergum II, a narrow transverse dark fuscous band across anterior margin of tergum II but not reaching lateral margins, an elongate black spot on midline of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with posterior margin almost straight.

ATTRACTANT: No known record.

COMMENTS

B. sepikae is similar to *B. strigifinis* (Walker) in abdominal and leg colour patterns and in the humeral and notopleural calli being joined by a yellow band but differs in having an almost entirely black mesonotum, very narrow lateral postsutural vittae and a unique U-shaped fuscous band across wing.

Bactrocera (*Sinodacus*) *strigifinis*

(Walker), n. comb. (Figs 374-376)

Dacus strigifinis Walker, 1861: 295.

Neodacus lanceolatus Perkins, 1939: 22-3, Harvey, 1959: 183 (syn.).

Dacus (*Chaetodacus*) *albilateralis* Malloch, 1939b: 413, Hering, 1941a: 53 (syn.).

Dacus (*Neodacus*) *lanceolatus* Harvey, 1954: 13-11, 1959: 183 (syn.).

Dacus (*Neodacus*) *strigifinis* Harvey, 1959: 183.

Dacus (*Pachydacus*) *strigifinis strigifinis* Drew, 1973: 10-13.

Neodacus strigifinis atritus May, 1962a: 65-6.

Dacus (*Pachydacus*) *strigifinis atritus* Drew, 1973: 10. New synonymy based on a study of the holotype of *N. strigifinis* from Queensland and Papua New Guinea.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISCUSSION), the holotype of *N. strigifinis atritus* May and part of the type series of *N. lanceolatus* Perkins.

LOCATION OF TYPES: *D. strigifinis*, 1 ♂ labelled "Moluccas, Bachan, Pres. by Saunders, B.M. 1868-4" in BMNH (not a type, see COMMENTS); *N. lanceolatus*, 23 syntypes (both sexes) in BMNH, 11 syntypes (both sexes) in UQ; *D. albilateralis*, holotype ♀ unknown, paratype ♂ in BMNH; *N. strigifinis atritus*, holotype ♂ (T.5880) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Common in eastern coastal rainforests of Queensland north from Cairns and throughout Papua New Guinea; type locality, Bachan, Moluccas.

NEW RECORDS: Torres Strait islands: Horn, Yorke (records from Plant Quarantine Survey). There are 2 specimens in DPI, 1 labelled Nila Point, Shortland Is, 17.v.1985 and 1 labelled Alu Point, Western Province, Solomon Islands, 17.v.1985, both collected by R. MacFarlane. These are damaged and are either *B. strigifinis* or an undescribed sibling species.

DIAGNOSIS

Medium sized species; small fuscous to black facial spots present; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum rich red-brown with irregular fuscous to black markings, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a narrow fuscous costal band and anal streak, a narrow fuscous band along dm-cu crossvein which becomes paler as it continues around hind margin of wing to anal streak, costal cells pale fulvous (second cell paler than first), microtrichia in outer corner of second costal cell

only; abdominal terga mostly red-brown with fuscous on lateral margins of tergum III and a large elongate oval fuscous spot on centre of tergum V.

DESCRIPTION

FEMALE: Ovipositor apex of piercer with 1 pair of lateral keels near level of gonopore and 1 pair of subapical lateral keels; 2 pairs of small subapical bristles near apex (Fig. 375). Spicules at distal end of middle segment of medium width with 7–11 elongate dentations (Fig. 376).

ATTRACTANT: Cue lure.

COMMENTS

B. strigifinis was described adequately by Drew (1973). It is similar to *B. emarginata* (Perkins) and *B. sepikae* in possessing abdominal terga mostly orange-brown, lateral and medial postsutural vittae present, humeral and notopleural calli joined by a lateral yellow band and in lacking a yellow triangular marking above the notopleural calli. It differs from *B. emarginata* in having the lateral postsutural vittae long and beginning anterior to the mesonotal suture, costal band narrow (not confluent with R₄₊₅), no fuscous spot in wing apex, infuscation on dm-cu crossvein and mesonotum mostly red-brown. It differs from *B. sepikae* in having the mesonotum not entirely black, lateral postsutural vittae broader and infuscation only on dm-cu crossvein.

Since Walker (1861) based his description of *B. strigifinis* on a female, the male in BMNH should not be regarded as a type (see COMMENTS under *B. curvifera*). Hardy (1959) did not call this specimen a type.

***Bactrocera (Sinodacus) surrufula*, n. sp.** (Fig. 377)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute (1400 m), attracted to cue lure, 14.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 3 ♂♂ (14.vi.1980), 2 ♂♂, 16.vi.1980, 5 ♂♂, 18.vi.1980, Mt Kaindi (1600 m), R.A.I. Drew and D.W. Currey; 4 ♂♂, 15.vi.1980, 2 ♂♂, 16.vi.1980, Wau Ecology Institute, R.A.I. Drew and D.W. Currey; 1 ♂, Mt Kaindi (1450 m), 18.vi.1980, A. Allison; 1 ♂, Upper Manki logging area, Bulolo, 8.iv.1980, P. Daur. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10593) and 2 paratypes (T.10594–T.10595) in QM; 6 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 8 paratypes in DPI.

DISTRIBUTION

Known only from the Morobe Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots small and circular; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum black, lateral and medial postsutural vittae present, mesopleural stripe of medium width reaching midway between the notopleural callus and anterior npl. bristle, scutellum yellow; wing with a dark fuscous spot across apical ½ and a broad dark fuscous costal band and anal streak, costal cells colourless, microtrichia in outer corner of second costal cell; abdominal terga III–V black with dark fuscous each side of a broad medial longitudinal black band.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.18 mm. Frons of even width, length 1.44 times breadth; fulvous with fuscous on anteromedial hump; latter covered by short dark setae; bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous with a pair of small circular facial spots, length of face 0.43 mm. Genae fulvous, fuscous subocular spot present; black bristle present. Occiput fuscous, yellow along eye margins; occipital row with 7–10 well developed dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.18 mm; 0.63 mm.

Thorax mesonotum black except dark red-brown below lateral postsutural vittae. Pleural areas black with no pale markings. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a distinct spot, anterior margin straight; upper hypopleural calli (posterior halves black); anterior ⅔ lower hypopleural calli (remainder black); a broad medial longitudinal postsutural vitta beginning just anterior to level of mesonotal suture and ending at level of upper pa. bristles; 2 parallel sided lateral postsutural vittae ending before upper pa. bristles; a broad band connecting humeral and notopleural calli. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae dark fuscous; fore and mid femora fulvous, hind femora black (except fulvous apically); tibiae and tarsi fulvous (except fore tibiae fuscous); a row of

long dark setae on dorsal surface of fore femora; mid tibiae each with an apical black spur.

Wings length 5.1 mm; costal cells with a very pale fuscous tint; microtrichia in outer corner of second costal cell; remainder of wings with a dark fuscous subcostal cell, a broad dark fuscous costal band confluent with R_{4+5} , a broad dark fuscous anal streak ending at wing margin and a distinct fuscous spot across apical $\frac{1}{2}$ of wing; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I black with a narrow transverse red-brown band on posterior margin but not reaching lateral margins; tergum II generally fuscous to black with red-brown across posterior margin but may vary to red-brown with an indistinct medial longitudinal fuscous to black band; terga III–V with a general black appearance but with more careful examination indistinct dark fuscous patterns are visible on terga III and IV either side of a broad medial longitudinal black band. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. surrufula is similar to *B. emarginata* (Perkins) and *B. strigifinis* (Walker) in possessing lateral and medial postsutural vittae, humeral and notopleural calli joined by a lateral yellow band and in lacking a yellow triangle above the notopleural calli but differs in having the apical $\frac{1}{2}$ of wing heavily infuscated and abdominal terga mostly dark fuscous to black.

Bactrocera (Sinodacus) triangularis (Drew), n. comb. (Fig. 378)

Asiadacus triangularis Drew, 1968a: 21–3.

Dacus (Pacifodacus) triangularis: Drew, 1972a: 12.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION); 3 ♂♂, Lelet Plateau, New Ireland, hand collected in rainforest, 4.xi.1981, J.W. Ismay; 1 ♂ (in UH), Buin, Bougainville I., October 1971, N.L.H. Krauss.

LOCATION OF TYPE: Holotype (T.6574) in QM.

DISTRIBUTION

Known from New Britain (type locality), New Ireland and Bougainville I.

DIAGNOSIS

Medium sized species; large black facial spots

present; posterior $\frac{1}{3}$ humeral calli yellow (anterior $\frac{2}{3}$ fulvous); anterior $\frac{1}{2}$ notopleural calli yellow (posterior $\frac{1}{2}$ fulvous), broad yellow band connecting humeral and notopleural calli; mesonotum generally uniformly fulvous, mesopleural stripe reaching to humeral callus, lateral postsutural vittae absent, medial postsutural vitta as a broad triangle, scutellum fulvous with yellow across centre but not extending to apex; wing with a narrow fuscous costal band and broad fuscous anal streak, a transverse fuscous band across centre but not reaching posterior margin and a transverse fuscous band across apex which continues around hind margin to join anal streak, first costal cell fulvous, second costal cell colourless, microtrichia in outer corner of second costal cell only; all abdominal terga fulvous except for a black spot in centre of tergum V.

ATTRACTANT: Cue lure.

COMMENTS

B. triangularis was described adequately by Drew (1968a). It is similar to *B. univittata* (Drew) in having medial postsutural vitta present and lateral postsutural vittae absent, humeral and notopleural calli joined by a lateral yellow band and no yellow triangular marking above notopleural calli. It differs from this species in having posterior $\frac{1}{3}$ of humeral calli and anterior $\frac{1}{2}$ of notopleural calli yellow (remainder fulvous), medial postsutural vitta triangular in shape, mesopleural stripes reaching humeral calli, a transverse fuscous band across wing enclosing dm–cu crossvein and continuing around wing margin to $A_1 + CuA_2$, a separate fuscous band enclosing r–m crossvein.

Bactrocera (Sinodacus) univittata (Drew), n. comb. (Fig. 379)

Dacus (Pacifodacus) univittatus Drew, 1972b: 189–91.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6985) in QM.

DISTRIBUTION

Bougainville I. (type locality, Kieta).

DIAGNOSIS

Medium sized species; very large black facial spots present; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum red-brown with fuscous markings, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae absent, medial postsutural vitta present, scutellum yellow; wing with a narrow

pale fuscous costal band and narrow fulvous anal streak, pale fuscous along r-m crossvein and a narrow infuscation along dm-cu crossvein which becomes paler as it continues around hind wing margin to join anal streak, first costal cell with a pale fulvous tint, second costal cell almost colourless, microtrichia in outer corner of second costal cell only; all abdominal terga red-brown with a large oval dark fuscous to black spot in centre of tergum V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. univittata was described adequately by Drew (1972b). It is similar to *B. triangularis* (Drew) in the characters listed in the comments on this species. *B. univittata* differs from this species in having the humeral and notopleural calli entirely yellow, medial postsutural vitta long and narrower, mesopleural stripe not reaching humeral callus and wing with pale fuscous around crossveins.

Subgenus *Zeugodacus* Hendel

Bactrocera (Zeugodacus) abdoangusta (Drew), n. comb. (Fig. 380)

Dacus (Zeugodacus) abdoangustus Drew, 1972b: 191-2.

MATERIAL EXAMINED

Paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6996) in QM.

DISTRIBUTION

Recorded from Central Sulawesi (Indonesia) by Hardy (1982), although he stated that the 2 specimens from Indonesia may represent a distinct species; type locality, Daru Village, Bougainville I.

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with black markings, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a general pale fulvous tint throughout membrane and a broad fuscous costal band and anal streak, pale infuscation along r-m crossvein and dark infuscation along dm-cu crossvein, costal cells fulvous with microtrichia in outer ½ of second costal cell only; abdominal terga III-V fulvous with a narrow transverse black band across base of tergum III and broad medial and 2 broad lateral

longitudinal dark fuscous to black band over all 3 terga.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. abdoangusta was described adequately by Drew (1972b). It is similar to *B. anchitrichota*, *B. chorista* (May) and *B. curta* (Drew) in possessing the costal band slightly widened in wing apex, a narrow infuscation along dm-cu crossvein and abdominal terga with ground colour orange-brown or fulvous. It differs from these species in having infuscation along r-m crossvein, costal cells fulvous, a black transverse band across base of tergum III joining the medial and lateral longitudinal black bands which extend over terga III-V.

Bactrocera (Zeugodacus) amoena (Drew), n. comb. (Fig. 381)

Dacus (Zeugodacus) amoenus Drew, 1972b: 192-3.

MATERIAL EXAMINED

Paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6999) in QM.

DISTRIBUTION

Bougainville I. (type locality, Kieta).

DIAGNOSIS

Small species; face glossy black; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, a broad medial postsutural vitta present, scutellum yellow; wing with a broad dark fuscous costal band and anal streak, a broad dark fuscous Z-shaped band across wing, costal cells pale fuscous with microtrichia in outer corner of second costal cell only; abdominal terga III-V fulvous with a broad medial and 2 broad lateral longitudinal black bands.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. amoena was described adequately by Drew (1972b). It is similar to *B. reflexa* (Drew) in possessing a Z-shaped fuscous band across wing, mesonotum glossy black, abdomen with a broad medial and 2 broad lateral longitudinal black bands over terga III-V. It differs from this species in having yellow notopleural calli, lateral postsutural vittae ending at upper pa. bristles, mesopleural stripe not reaching humeral callus, microtrichia in outer corner of second costal cell

only and no transverse black band across base of tergum III.

***Bactrocera (Zeugodacus) anchitrichota*, n. sp.**
(Fig. 382)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, East Sepik Province: Maprik, Oct. 1958, Malaria Control Section.

LOCATION OF TYPE: Holotype (T.10596) in QM.

DISTRIBUTION

Known only from Maprik, East Sepik Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots small and pale fuscous; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching almost to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, medial postsutural vitta present, scutellum yellow; legs fulvous except hind tibiae pale fuscous; wing with a narrow fuscous costal band almost confluent with R₄₊₅ but expanding at apex and a broad fuscous anal streak, narrow infuscation around dm-cu crossvein, costal cells with a pale fulvous tint and microtrichia in outer corner of second costal cell only; all abdominal terga uniformly orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.6 mm. Frons of even width, length 1.39 times breadth; fulvous without dark markings, anteromedial hump covered by a large number of small pale setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous with very small pale fuscous spots; length of face 0.53 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with 6-7 strong dark bristles and a large number of smaller pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.28 mm; 0.73 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices

red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 broad lateral postsutural vittae beginning anterior to mesonotal suture and tapering posteriorly to end well before upper pa. bristles; a broad medial postsutural vitta broadly rounded posteriorly and narrowing to a point anterior to mesonotal suture. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except hind tibiae pale fuscous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.8 mm; costal cells with a pale fulvous tint; microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R₂₋₃ and widening at apex, a narrow infuscation along dm-cu crossvein, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around A₁ + CuA₂; supernumerary lobe very strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All abdominal terga orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. anchitrichota is similar to *B. abdoangusta* (Drew), *B. chorista* (May) and *B. curta* (Drew) in possessing infuscation on 1 or both crossveins in addition to costal band and anal streak. It differs from *B. abdoangusta* in lacking infuscation on r-m crossvein and having costal cells extremely pale fulvous, and from *B. chorista* and *B. curta* in possessing uniformly orange-brown abdominal terga.

Bactrocera (Zeugodacus) brachus
(Drew), n. comb. (Fig. 383)

Dacus (Zeugodacus) brachus Drew, 1972b: 194-5.

MATERIAL EXAMINED

Paratype ♂ in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6994) in QM.

DISTRIBUTION

Mt Lawes (250 m), Central Province, Papua New Guinea (type locality).

DIAGNOSIS

Medium sized species; face dark fuscous to black; humeral and notopleural calli yellow; mesonotum black with a variable pattern of red-brown markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a narrow dark fuscous costal band and broad dark fuscous anal streak, costal cells pale fuscous (second cell paler in centre), microtrichia in outer $\frac{1}{2}$ of first and second costal cells; abdominal terga mostly orange-brown with a short narrow medial longitudinal dark fuscous spot in centre of tergum V.

ATTRACTANT: Cue lure.

COMMENTS

B. brachus was described adequately by Drew (1972b). It is similar to *B. daula* and *B. fallacis* (Drew) in possessing wings with no additional infuscation other than costal band of uniform width and anal streak, scutellum entirely yellow, lateral and medial postsutural vittae present and face entirely dark fuscous to black. It differs from *B. fallacis* in having the mesonotum mostly black and from *B. daula* in having microtrichia in outer $\frac{1}{2}$ of each costal cell, abdominal terga III–V mostly orange-brown with a small medial longitudinal dark fuscous spot on tergum V.

Bactrocera* (*Zeugodacus*) *chorista
(May), n. comb. (Figs 384–386)

Zeugodacus choristus May, 1962a: 72–4.

Dacus (*Zeugodacus*) *choristus*: Drew, 1973: 21–3.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.5874) in QM.

DISTRIBUTION

Widely distributed throughout the eastern coastal areas of Queensland (type locality, Atherton) and Papua New Guinea.

DIAGNOSIS

Medium sized species; medium sized fuscous to black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with fuscous to black markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum

yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, pale infuscation along dm–cu crossvein which becomes paler around posterior margin of wing to anal streak, first costal cell pale fuscous, second costal cell paler than first and with a tinge of pale fuscous around perimeter, microtrichia in outer corner of second costal only; abdominal terga III–V fulvous with a broad black band across base of tergum III and a broad medial and 2 broad lateral longitudinal dark fuscous to black band over all 3 terga.

DESCRIPTION

FEMALE: No dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1.49:1. Apex of piercer broad and narrowing to a sharp tip with 5 pairs of subapical bristles (2 large and 3 small) (Fig. 385). Spicules at distal end of middle segment narrow, some elongate triangular and others with 3–5 dentations (1 or 2 elongate triangular, remainder small) (Fig. 386).

HOST PLANTS

NEW RECORD: *Diplocyclos palmatus* (Curcubitaceae), Samford Valley, south-east Queensland, March 1987, E. Hamacek.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. chorista was described adequately by May (1962a) and Drew (1973). The costal band is broader than as described by May, overlapping R_{2+3} . It is similar to *B. curta* (Drew) and *B. anchitrichota* in the absence of infuscation along r–m crossvein and in possessing costal cells extremely pale fulvous or fuscous. It differs from *B. anchitrichota* in having dark colour patterns on the abdomen and from *B. curta* in having the general wing membrane colourless, mesonotum basically red-brown with small dark markings and abdomen with a transverse black band across base of tergum III.

***Bactrocera* (*Zeugodacus*) *cucurbitae* (Coquillett)**
(Figs 387–389)

Dacus cucurbitae Coquillett, 1899: 129; Froggatt, 1909: 84–5.

Bactrocera cucurbitae: Bezzi, 1913: 96–7.

Chaetodacus cucurbitae: Bezzi, 1916: 109–10; Hendel, 1915: 426, 1927a: 28; Shiraki, 1933: 73–6.

Strumeta cucurbitae: Perkins, 1938: 127.

Dacus (Strumeta) cucurbitae: Hardy and Adachi, 1954: 164–5; Hardy, 1973: 38–40, 1974: 27–9.

Dacus (Zeugodacus) cucurbitae: Drew, 1973: 23–7; Hardy, 1977: 57, 1982: 203, 1983: 36.

MATERIAL EXAMINED

A large series of specimens in DPI (see DISTRIBUTION); 3 of Coquillett's types.

LOCATION OF TYPES: Lectotype ♀, 1 ♀ and 2 ♂ paralectotypes in NMNH. Type locality, Honolulu, Hawaii (not endemic here but first collected and described after introduction from South East Asia).

DISTRIBUTION

Widely distributed around the world. See Drew (1982) for its distribution range in the Asian and Pacific regions. Cogan and Munro (1980) have recorded it from Kenya, Mauritius and Tanzania and Munro (1984) from Kenya and Reunion.

DIAGNOSIS

Medium sized species; large black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with or without fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, narrow medial postsutural vitta present, scutellum yellow; wing with a broad fuscous costal band expanding into a fuscous spot at wing apex, a broad fuscous anal streak, dark fuscous along dm–cu crossvein, pale infuscation along r–m crossvein, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga III–V orange-brown except for a narrow transverse black band across anterior margin of tergum III which expands over anterolateral corners, a narrow medial longitudinal dark fuscous to black band over all 3 terga and anterolateral corners of terga IV and V fuscous.

DESCRIPTION

FEMALE: Piercer needle shaped with 4 pairs of subapical bristles close to apex (2 very long and 2 short) (Fig. 388). Spicules at distal end of middle segment of medium width with 3–6 dentations mostly broad and elongate (Fig. 389).

HOST PLANTS

B. cucurbitae has been reared from a wide variety of commercial fruit and vegetable crops and is classified as a species of major economic importance. It primarily infests cucurbit crops. Little is known about the wild hosts in South East Asia (the area to which this species is endemic).

ATTRACTANT: Cue lure.

COMMENTS

B. cucurbitae was described adequately by Drew (1973). It is similar to *B. emittens* (Walker) in possessing only a slight widening of the costal band in wing apex, a narrow infuscation along dm–cu crossvein and abdominal terga with ground colour fulvous but differs in having the spot on apex of costal band not reaching M, costal cells colourless, abdominal tergum III with a narrow transverse black band across base and tip of piercer of ovipositor needle shaped.

In the original description, Coquillett listed the material studied as follows: "Two males and two females bred by Mr George Compere from larvae living in green cucumbers. Type No.4207, U.S. Nat. Museum". This does not appear to be a valid holotype designation (see comments for *B. facialis*). I have received 3 of these specimens for study and designate the specimen labelled "Type No.4207 USNM" by Coquillett as lectotype and the remaining specimens paralectotypes.

Bactrocera (Zeugodacus) curta (Drew), n. comb. (Fig. 390)

Dacus (Zeugodacus) curtus Drew, 1972b: 195–6.

MATERIAL EXAMINED

A series of paratypes in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6997) in QM.

DISTRIBUTION

New Britain (type locality).

DIAGNOSIS

Medium sized species; a pair of medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum mostly black, mesopleural stripe reaching anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a broad fuscous costal band and anal streak, a pale fulvous tint across wing membrane and dark infuscation along dm–cu crossvein which continues around posterior margin of wing to anal streak, costal cells fulvous with microtrichia in outer 1/3 of second costal cell only; abdominal terga III–V fulvous with a broad medial and 2 broad lateral longitudinal dark fuscous to black bands over all 3 terga.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. curta was described adequately by Drew (1972b). It is similar to *B. chorista* (May) in possessing a medial and 2 lateral longitudinal dark

bands on terga III–V, no infuscation on r–m crossvein and costal cells extremely pale fulvous or fuscous. It differs from this species in having a pale fulvous tint in wing membrane, mesonotum basically black with irregular red-brown markings and abdomen short without a transverse black band across base of tergum III.

***Bactrocera (Zeugodacus) daula*, n. sp.**
(Fig. 391)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Western Highlands District: Mt Hagen, 31.iii.1981, B. Thistleton.

Paratypes, PAPUA NEW GUINEA, Western Highlands District: 2 ♂♂, 16.xii.1980, 1 ♂, 22.iv.1981, Mt Hagen, B. Thistleton. All paratypes attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10597) in QM; 3 paratypes in DPI.

DISTRIBUTION

Known only from Mt Hagen, Western Highlands District, Papua New Guinea.

DIAGNOSIS

Medium sized species; face glossy black; humeral and notopleural calli yellow; mesonotum black with pale markings, lateral and medial postsutural vittae present, mesopleural stripe of medium width reaching midway between anterior margin of notopleural callus and anterior npl. bristle, scutellum yellow; wing with a narrow dark fuscous costal band and broad dark fuscous anal streak, costal cells pale fuscous, microtrichia covering second costal cell and most of first costal cell; abdominal terga III–V orange-brown except for a broad medial and 2 broad lateral longitudinal dark bands which meet along anterior margin of tergum III.

DESCRIPTION

MALE: Male generally fulvous. Vertical length 1.1 mm. Frons narrowing slightly posteriorly, length 1.17 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face glossy black; length of face 0.35 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput dark fulvous with fuscous markings, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 dark fulvous, segment 3 dark fulvous with fuscous on apex and outer surface; a weak dark fulvous dorsal bristle

on segment 2; arista black (dark fulvous basally); length of segments: 0.13 mm; 0.23 mm; 0.65 mm.

Thorax mesonotum black except a medial longitudinal dark fuscous band between medial postsutural vitta and anterior margin of mesonotum, brown below and behind lateral postsutural vittae. Pleural areas black. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 lateral postsutural vittae of medium width beginning anterior to mesonotal suture and narrowing slightly posteriorly to end at upper pa. bristles; a medial postsutural vitta broadly rounded at prescutellar bristles and narrowing to a point anterior to level of mesonotal suture. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fulvous, mid and hind coxae fuscous to dark fuscous; all other segments fulvous; rows of short pale setae on dorsal surfaces of fore femora; apical black spur absent on mid tibiae.

Wings length 5.4 mm; costal cells pale fuscous, microtrichia covering all of second costal cell and most of first costal cell; remainder of wings colourless except for a very pale fuscous tint across central area of membrane, dark fuscous subcostal cell, narrow dark fuscous costal band overlapping R_{2+3} and ending at extremity of M, broad dark fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark fuscous except for a narrow orange-brown band along posterior margin but not reaching lateral margins; tergum II orange-brown except for a broad transverse black band across anterior $\frac{1}{2}$ which widens to cover lateral margins; terga III–V orange-brown except for a broad medial longitudinal band which is dark fuscous on tergum III and black on terga IV and V, 2 broad lateral longitudinal dark fuscous bands. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. daula is similar to *B. brachus* (Drew) in having the mesonotum basically black, face entirely dark fuscous to black, scutellum yellow and lateral and medial postsutural vittae present but differs in microtrichia covering all of second costal cell and most of first costal cell, abdominal terga III–V orange-brown with a broad medial and 2 broad lateral longitudinal dark fuscous to black bands meeting along anterior margin of tergum III.

Bactrocera* (*Zeugodacus*) *emittens
(Walker), n. comb. (Fig. 392)

Dacus emittens Walker, 1860: 152; Froggatt, 1909: 96.

Dacus chrysotoxus Hendel, 1912: 24; Perkins, 1939: 29 (syn.).

Zeugodacus emittens: Perkins, 1939: 29.

Dacus (*Zeugodacus*) *emittens*: Hardy and Adachi, 1954: 187–8; Hardy, 1959: 171, 1977: 58; Drew, 1973: 27–30.

MATERIAL EXAMINED

INDONESIA, Sulawesi: syntype ♀ in BMNH; 4 syntypes referred to as cotypes by Hardy and Adachi (1954) and labelled "*Dacus emittens*, Celebes" in Walker's handwriting, collected at Makassar, Celebes.

LOCATION OF TYPES: *D. emittens*, 4 syntypes (both sexes) in BMNH (Hardy, 1959), 4 syntypes in NMV, Walker mentioned both sexes in his original description; *D. chrysotoxus*, holotype ♀ unknown.

DISTRIBUTION

Known from Sulawesi, formerly Celebes (type locality, Makassar), Lesser Sunda Is and the Moluccas (Hardy, 1977). Large numbers were trapped on Sulawesi, July 1981, J. Turner (record from Plant Quarantine Survey).

DIAGNOSIS

Large species; medium sized black facial spots present; humeral and notopleural calli yellow; mesonotum red-brown with dark markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, a broad medial postsutural vitta present, scutellum yellow; wing with a broad fuscous costal band and anal streak, a large fuscous spot in apex of wing which extends along dm–cu crossvein, costal cells pale fulvous (second cell tending paler in centre), microtrichia in outer ½ of second costal cell only; abdominal terga III–V orange-brown with a narrow dark fuscous to black band along anterior margin of tergum III and a broad medial longitudinal dark fuscous band on terga IV and V.

ATTRACTANT: Cue lure.

COMMENTS

B. emittens was described adequately by Drew (1973). It is similar to *B. cucurbitae* (Coquillett) in having the costal band expanded into a distinct apical spot, a broad dark fuscous band along dm–cu crossvein, mesonotum mostly red-brown and abdominal terga basically orange-brown. It differs from this species in possessing the apical spot on the wing overlapping M and sometimes connected to the fuscous band along dm–cu crossvein, costal cells pale fulvous, abdominal tergum III with a moderately broad dark fuscous to black band across base, terga IV and V with a moderately broad medial longitudinal dark fuscous band without dark colouration on anterolateral corners and tip of piercer of ovipositor with a pair of subapical lobes.

Bactrocera* (*Zeugodacus*) *exornata
(Hering), n. comb. (Fig. 393)

Zeugodacus exornatus Hering, 1941b: 55–6.

Dacus (*Zeugodacus*) *exornatus*: Drew, 1973: 30–1.

MATERIAL EXAMINED

Holotype ♂.

LOCATION OF TYPE: Holotype in HNHM.

DISTRIBUTION

Dammer I. (probably Damar), type locality.

DIAGNOSIS

Small species; face glossy black; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to anterior npl. bristle, lateral and medial postsutural vittae present, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only, abdominal colour patterns unknown.

ATTRACTANT: No known record.

COMMENTS

B. exornata was described adequately by Drew (1973). It is similar to *B. timorensis* (Perkins) in possessing an entirely black mesonotum, microtrichia in outer corner of second costal cell only, scutellum yellow, lateral and medial postsutural vittae present but differs from this species in having a glossy black face and lateral postsutural vittae ending at upper pa. bristles.

Bactrocera* (*Zeugodacus*) *fallacis
(Drew), n. comb. (Fig. 394)

Dacus (*Zeugodacus*) *fallacis* Drew, 1972b: 196–8.

MATERIAL EXAMINED

Paratype ♂ in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6995) in QM.

DISTRIBUTION

Rocky River (type locality) and Peach Creek, Cape York Peninsula, Queensland.

DIAGNOSIS

Small species; face dark fuscous to black; humeral and notopleural calli yellow; mesonotum red-brown with a pattern of fuscous markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a narrow dark fuscous costal band and broad dark fuscous anal streak, costal cells pale fuscous with microtrichia in outer ½ of second costal cell only; abdominal terga III–V orange-brown with a narrow transverse fuscous band across anterior margin of tergum III and a medial longitudinal fuscous band over all 3 terga.

ATTRACTANT: Cue lure.

COMMENTS

B. fallacis was described adequately by Drew (1972b). It is similar to *B. daula* and *B. brachus* (Drew) in possessing a black face, lateral and medial postsutural vittae and yellow scutellum but differs in having the mesonotum mostly red-brown with a pattern of fuscous markings, a narrow transverse fuscous band across base of tergum III and a narrow medial longitudinal fuscous band on terga III–V.

Bactrocera (Zeugodacus) fulvifacies
(Perkins), n. comb. (Fig. 395)

Zeugodacus fulvifacies Perkins, 1939: 32.

Dacus (Zeugodacus) fulvifacies: Drew, 1973: 31–3

MATERIAL EXAMINED

Holotype ♂, Dumbea, New Caledonia, January 1914, P.D. Montague.

LOCATION OF TYPE: Holotype in BMNH.

DISTRIBUTION

Dumbea, New Caledonia (type locality).

DIAGNOSIS

Small species; facial spots absent; humeral calli yellow (except anterodorsal corners black); notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching to anterior npl. bristle,

lateral and medial postsutural vittae absent; scutellum yellow with a broad medial glossy black band; wing entirely colourless except for a pale fulvous tint in anal cell, costal cells colourless with microtrichia in outer corner of second costal cell only; all abdominal terga glossy black.

ATTRACTANT: No known record.

COMMENTS

B. fulvifacies was described adequately by Drew (1973). It is distinct from all other species of subgenus *Zeugodacus* in having postsutural vittae absent, scutellum with a broad black medial longitudinal band on dorsal surface, mesonotum and abdominal terga entirely black and wings entirely colourless except for a pale fulvous tint in anal cell.

Bactrocera (Zeugodacus) gracilis
(Drew), n. comb. (Fig. 396)

Dacus (Zeugodacus) gracilis Drew, 1972b: 198–9.

MATERIAL EXAMINED

Paratype ♂ in DPI.

LOCATION OF TYPE: Holotype ♂ (T.6998) in QM.

DISTRIBUTION

Malekula I. (type locality), Vanuatu (formerly New Hebrides).

DIAGNOSIS

Medium sized species; face glossy black; humeral and notopleural calli yellow; mesonotum black with a pattern of brown markings, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, broad medial postsutural vitta present, scutellum yellow; wing with a broad fuscous costal band and anal streak, an S-shaped fuscous band across wing, costal cells pale fuscous with microtrichia in outer ⅓ of second costal cell only; abdominal terga I–V mostly orange-brown except for a broad medial and 2 broad lateral longitudinal black bands over terga III–V.

ATTRACTANT: Cue lure, Willison's lure.

COMMENTS

B. gracilis was described adequately by Drew (1972b). It is similar to *B. amoena* (Drew) and *B. reflexa* (Drew) in having a recurved fuscous band across wing but differs in possessing an S-shaped band across wing which is connected to the costal band at the r–m crossvein and mesonotum black with large brown markings.

***Bactrocera (Zeugodacus) macrovittata*, n. sp.**
(Fig. 397)

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Central District: Moresby-Bereina road, 88 km NW Port Moresby, attracted to cue lure, 26.vi.1980, R.A.I. Drew and D.W. Currey.

LOCATION OF TYPE: Holotype (T.10598) in QM.

DISTRIBUTION

Known only from the Central Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with medium sized black spots present; humeral and notopleural calli yellow; mesonotum red-brown with a mottled appearance, lateral and medial postsutural vittae present, a triangular marking above each notopleural callus, mesopleural stripe of medium width ending just before anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous (second cell paler), microtrichia in outer $\frac{1}{3}$ of second costal cell only; abdominal terga III-V fulvous except for 2 lateral longitudinal red-brown bands joined along anterior margin of tergum III, a medial longitudinal band which is red-brown on anterior and black on posterior of each tergum.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.75 mm. Frons of even width, length 1.6 times breadth; fulvous with no dark markings; anteromedial hump covered with a small number of well developed pale setae; orbital bristles well developed and black: 1 s.or., 1 i.or. (plus 1 reduced i.or. on 1 side only); lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with medium sized circular black spots not reaching epistoma; length of face 0.58 mm. Genae fulvous, dark subocular spot absent; fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 1-2 well developed dark bristles and a large number of small pale bristles. Antennae with segments 1 and 2 fulvous; segment 3 fulvous except fuscous on apex and outer surface; a well developed pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.18 mm; 0.25 mm; 0.80 mm.

Thorax mesonotum red-brown with a mottled appearance due to sites of attachments of dorsoventral flight muscles. Pleural areas red-brown with no dark markings. Yellow markings as follows: humeral calli; notopleural calli; a

triangular marking along anterior margin of mesonotal suture above each notopleural callus; mesopleural stripe of medium width, ending just before anterior npl. bristle dorsally, continuing to sternopleuron as a large oval spot, anterior margin straight; 2 moderately broad, parallel sided lateral postsutural vittae ending at upper pa. bristles; a moderately broad medial postsutural vitta, rounded posteriorly at level of prsc. bristles and narrowing to a point anteriorly at level of posterior margin of humeral calli (this vitta is much longer than in any other species of Dacine); upper hypopleural calli (posterior apices fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder fuscous). Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 4; prsc. 1 (1 absent); pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black except mpl. red-brown.

Legs all segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur; fore femora with rows of long dark setae on dorsal surfaces.

Wings length 6.5 mm; costal cells pale fuscous (second cell paler), microtrichia in outer $\frac{1}{3}$ of second costal cell only; remainder of wings colourless except for a fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and ending between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. Terga I and II red-brown, tending whitish along posterior margin of tergum II. Terga III-V fulvous except 2 broad lateral longitudinal red-brown bands joined along anterior margin of tergum III, a medial longitudinal band which is narrow and red-brown anteriorly and broad and black posteriorly on each tergum. A pair of oval fulvous shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

B. macrovittata is similar to *B. sandaracina* and *B. trichota* (May) in possessing a red-brown mesonotum, a pair of dark facial spots, scutellum yellow, lateral and medial postsutural vittae present. It differs from these species in having a triangular yellow marking above notopleural callus along anterior margin of mesonotal suture, costal band confluent with R_{2+3} and the medial

postsutural vitta very long and narrow reaching level of anterior npl. bristles.

Bactrocera (Zeugodacus) reflexa
(Drew), n. comb. (Fig. 398)

Dacus (Zeugodacus) reflexus Drew, 1971: 101–3.

MATERIAL EXAMINED

A series of paratypes in DPL.

LOCATION OF TYPE: Holotype ♂ (T.6974) in QM.

DISTRIBUTION

Known only from localities in New Britain (type locality, Keravat).

DIAGNOSIS

Medium sized species; face glossy black; humeral calli yellow; notopleural calli black except area on apex around base of bristle yellow; mesonotum glossy black, mesopleural stripe reaching humeral callus, lateral postsutural vittae beginning anterior to mesonotal suture, medial postsutural vitta present, scutellum yellow; wing with a broad dark fuscous costal band and anal streak, a broad Z-shaped dark fuscous band across wing, costal cells dark fuscous, microtrichia covering second costal cell only; abdominal terga III–V fulvous except for a broad medial and 2 broad lateral longitudinal glossy black bands over all 3 terga which join along anterior margin of tergum III.

ATTRACTANT: Cue lure.

COMMENTS

B. reflexa was described adequately by Drew (1971). It is similar to *B. amoena* (Drew) in possessing a Z-shaped dark fuscous band across wing, mesonotum glossy black and abdomen with a broad medial and 2 broad lateral longitudinal black bands over terga III–V. It differs from this species in having black notopleural calli with yellow on apex, lateral postsutural vittae ending behind the upper pa. bristles, mesopleural stripe reaching humeral callus, microtrichia covering all of second costal cell and a transverse black band across base of tergum III joining the longitudinal bands.

***Bactrocera (Zeugodacus) sandaracina*, n. sp.**
(Fig. 399)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, East Sepik Province: Maprik, Oct.–Dec. 1957, Malaria Control Section.

Paratypes, PAPUA NEW GUINEA, East Sepik Province: 1 ♀ and 2 ♂♂, Maprik, Oct.–Dec. 1957, Malaria Control Section; 1 ♂, Maprik, Oct. 1958, Malaria Control Section.

LOCATION OF TYPES: Holotype (T.10599) in QM; 1 paratype in ANIC; 3 paratypes in DPL.

DISTRIBUTION

Known only from Maprik, East Sepik Province, Papua New Guinea.

DIAGNOSIS

Medium sized to large species; facial spots very small and pale fuscous; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning before mesonotal suture, medial postsutural vitta present, scutellum yellow; legs with all segments fulvous, wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fulvous (second cell paler) with microtrichia in outer corner of second costal cell only; all abdominal terga uniformly orange-brown without dark markings.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons of even width, length 1.31 times breadth; fulvous without dark markings, anteromedial hump covered by short pale setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with very small pale fuscous oval facial spots; length of face 0.55 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of strong red-brown bristles. Antennae with all segments fulvous; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.30 mm; 0.83 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); 2 parallel sided lateral postsutural vittae of medium width, beginning anterior to mesonotal suture and ending behind upper pa. bristles, a moderately broad medial postsutural vitta broadly rounded posteriorly at level of prsc. bristles and narrowing to a point anteriorly to end anterior to mesonotal suture. Postnotum red-brown. Scutellum yellow except for very narrow red-brown basal band. Bristles: sc. 4;

prsc. 2; pa. 2; sa 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and red-brown to black.

Legs all segments fulvous without dark markings; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 7.4 mm; costal cells pale fulvous (second cell paler); microtrichia in outer corner of second costal cell only; remainder of wings with a pale fulvous tint, narrow fuscous costal band almost confluent with R_{4+5} and ending between extremities of R_{4+5} and M, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe very strong.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All abdominal terga uniformly orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment orange-brown, oval in transverse cross section and tapering posteriorly in dorsal view. Ratio of length of ovicape to length of tergum V 1.17:1. Apex of piercer with 1 pair of subapical keels (Fig. 399A).

ATTRACTANT: No known record.

COMMENTS

B. sandaracina is similar to *B. trichota* (May) in lacking a triangular yellow marking above notopleural calli and in possessing the costal band overlapping R_{2+3} , a reasonably short medial postsutural vitta (not extending anterior to mesonotal suture), mesonotum basically red-brown, face fulvous with dark spots and one or both costal cells coloured. It differs from this species in having the mesonotum uniformly red-brown without dark markings, abdominal terga uniformly orange-brown without dark markings, facial spots very small and pale fuscous, lateral postsutural vittae ending behind upper pa. bristles, costal band broad almost confluent with R_{4+5} and mesopleural stripes reaching midway between anterior margin of notopleural calli and anterior npl. bristles above.

Bactrocera (Zeugodacus) terminifera (Walker), n. comb.

Dacus terminifer Walker, 1860: 152.

Zeugodacus terminifer: Perkins, 1939: 28–9 (lectotype designation).

Dacus (Zeugodacus) terminifer: Hardy and Adachi, 1954: 195–6; Hardy, 1959: 183; Drew, 1973: 33.

MATERIAL EXAMINED

Lectotype ♀, labelled “Celebes, Macassar, W.W. Saunders, B.M. 1868-4” and other labels in Walker’s handwriting “*terminifer*”, “Mak”, “68-4”.

LOCATION OF TYPE: Lectotype in BMNH.

DISTRIBUTION

Makassar (type locality), Sulawesi (formerly Celebes).

DESCRIPTION

FEMALE: The female type is the only specimen known and is in poor condition with the abdomen missing. The following description has been taken from this specimen:

Head generally dark. Frons of even width, fulvous with fuscous laterally and across upper margin; orbital bristles: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex black. Face black. Genae fuscous, black subocular spot present; black bristle present. Occiput black. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; arista dark fuscous (fulvous basally).

Thorax mesonotum glossy black. Yellow markings as follows: humeral calli (anterodorsal corners glossy black); notopleural calli; broad mesopleural stripe reaching to humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); 2 very short and narrow lateral postsutural vittae ending at level of sa. bristles. Postnotum black. Scutellum yellow with a black basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore, mid and apical $\frac{1}{2}$ of hind femora black (basal $\frac{1}{2}$ hind femora fulvous); fore and mid tibiae fulvous, hind tibia dark fuscous; all tarsal segments fulvous; rows of long black setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings costal cells colourless; microtrichia in outer corner of second costal cell only; remainder of wings colourless except pale fuscous subcostal cell, narrow very pale costal band confluent with R_{2+3} and ending at apex of this vein, a small fuscous spot at apex of wing around R_{4+5} , a broad fuscous anal streak ending before wing margin.

ATTRACTANT: No known record.

COMMENTS

B. terminifera is similar to *B. exornata* (Hering) in possessing a black face, glossy black mesonotum, yellow scutellum and colourless wings except for costal band and anal streak but differs in having very short lateral postsutural vittae and the medial postsutural vitta absent.

Perkins (1939) designated the lectotype of *B. terminifera* "by inference of holotype" according to Article 74b of the International Code of Zoological Nomenclature.

Bactrocera (Zeugodacus) timorensis

(Perkins), n. comb. (Fig. 400)

Zeugodacus timorensis Perkins, 1939: 30–1.

Dacus (Zeugodacus) timorensis: Hardy and Adachi, 1954: 196; Drew, 1973: 33–5.

MATERIAL EXAMINED

Holotype ♀, Koepang, Timor, June 1929, I.M. Mackerras and the following specimens in BMNH: paratype ♀, Timor, vi.1929; 1 ♀ and 1 ♂, Mittel Flores, Endeh, 10–16.6.27; B. Rensch.

LOCATION OF TYPE: Holotype in ANIC.

DISTRIBUTION

Known only from Timor (type locality, Koepang) and Flores.

DIAGNOSIS

Small species; small fuscous facial spots present; humeral and notopleural calli yellow; mesonotum glossy black, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, a broad medial postsutural vitta present, scutellum yellow with a very broad black basal band; wing with a narrow fuscous costal band and anal streak, costal cells colourless with microtrichia in outer corner of second costal cell only; abdominal terga III–V fulvous with 2 broad lateral longitudinal dark fuscous bands over all 3 terga which join along anterior margin of tergum III.

ATTRACTANT: No known record.

COMMENTS

Previously a male has not been studied. The posterior lobe of surstylus is long, the posterior margin of abdominal sternum V has a shallow concavity and a pecten is present on abdominal tergum III. These characters now confirm the placement of this species in subgenus *Zeugodacus*. *B. timorensis* was described adequately by Drew (1973). It is similar to *B. exornata* (Hering) in possessing a glossy black mesonotum, colourless

costal cells, scutellum entirely yellow, lateral and medial postsutural vittae present but differs in having a fulvous face with a pair of small fuscous spots and lateral postsutural vittae ending well before the upper pa. bristles.

Bactrocera (Zeugodacus) trichota

(May), n. comb. (Figs 401–403)

Zeugodacus trichotus May, 1962a: 74–6.

Dacus (Zeugodacus) trichotus: Drew, 1973: 35–8.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.5857) in QM.

DISTRIBUTION

Known from New Britain and localities in the Eastern Highlands District (type locality, Kerowaghi) and Central Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots vary from small elongate fuscous spots to medium sized circular black spots; humeral and notopleural calli yellow; mesonotum generally red-brown, mesopleural stripe reaching to anterior npl. bristle, lateral postsutural vittae beginning anterior to mesonotal suture, a broad medial postsutural vitta present, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, first costal cell with a pale fulvous tint, second costal cell almost colourless, microtrichia in outer 1/3 of second costal cell only; abdominal terga I–V mostly orange-brown except for a narrow medial longitudinal dark fuscous to black band on posterior 1/2 of tergum IV and tergum V.

DESCRIPTION

FEMALE: Ovipositor apex of piercer needle shaped with 3 pairs of very small subapical bristles (Fig. 402). Spicules at distal end of middle segment with only 5–8 small dentations of even size visible above background membrane (Fig. 403).

ATTRACTANT: Cue lure.

COMMENTS

B. trichota was described adequately by May (1962a) and Drew (1973). It is similar to *B. sandaracina* in possessing the costal band overlapping R₂₊₃, lateral and medial postsutural vittae present, mesonotum red-brown, face fulvous with 1 pair of dark spots, scutellum entirely yellow and in lacking a yellow triangle above each notopleural callus. It differs from this species in

having the mesonotum red-brown with irregular fuscous markings, abdominal terga orange-brown with a narrow medial longitudinal fuscous band on posterior $\frac{1}{2}$ of tergum IV and on tergum V, facial spots medium sized and elongate to circular, mesopleural stripe reaching to anterior npl. bristles, lateral postsutural vittae ending at upper pa. bristles and costal band just overlapping R_{2+3} .

***Bactrocera (Zeugodacus) unilateralis*, n. sp.**
(Fig. 404)

TYPE SPECIMEN

Holotype σ , PAPUA NEW GUINEA, Central District: 20 km SE Port Moresby, hand swept off bushes, 6.ii.1982, J.W. Ismay.

LOCATION OF TYPE: Holotype (T.10600) in QM.

DISTRIBUTION

Central Province, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with very small and pale spots; humeral and notopleural calli yellow and joined by a broad yellow band; mesonotum black, lateral and medial postsutural vittae present, mesopleural stripe broad reaching to anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band, a pale infuscation along r-m crossvein, a pale fuscous tint in anal cell but no anal streak present, costal cells colourless, microtrichia in outer corner of second costal cell only; abdominal terga uniformly orange-brown with an elongate fuscous spot centrally on tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.5 mm. Frons of even width, length 1.4 times breadth; fulvous with fuscous on anteromedial hump and connecting along lateral margins with fuscous marking on vertex, anteromedial hump covered by a small number of short dark setae; orbital bristles black: 1 s.or., 3 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous with very small pale spots present; length of face 0.53 mm. Genae fulvous, brown subocular spot present; red-brown bristle present. Occiput fulvous with 2 black spots, yellow along eye margins; occipital row with 4 well developed black bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong dark dorsal bristle on segment 2; arista

black (fulvous basally); length of segments: 0.15 mm; 0.25 mm; 0.80 mm.

Thorax mesonotum black with brown below and behind lateral postsutural vittae. Pleural areas black except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; a broad band connecting humeral and notopleural calli; broad mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black); a medial postsutural vitta of medium width, rounded posteriorly at level of prsc. bristles and narrowing to a point level with mesonotal suture; 2 broad parallel sided lateral postsutural vittae ending just behind upper pa. bristles. Postnotum black. Scutellum yellow except for a narrow black basal band. Bristles: sc. 4; prsc. 2; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except apical 4 segments of fore tarsi and the hind tibiae pale fuscous and the apical 4 segments of the mid and hind tarsi dark fulvous; rows of long pale setae on dorsal and ventral surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.6 mm; costal cells colourless, microtrichia in outer corner of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and narrowing apically to end between extremities of R_{4+5} and M, a pale fuscous tint along dm-cu crossvein, a very pale tint in basal section of anal cell; dense aggregation of microtrichia around $A_1 + CuA_2$; super-numerary lobe of medium development.

Abdomen oval; terga free; pecten present on tergum III. Tergum I and sterna I and II wider than long. All abdominal terga uniformly orange-brown except for an elongate pale fuscous spot in centre of tergum V. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

B. unilateralis is similar to *B. sandaracina*, *B. anchitrichota*, *B. brachus* (Drew) and *B. macrovittata* in possessing abdominal terga mostly orange-brown but differs in having the humeral and notopleural calli joined by a broad lateral yellow band.

KEY TO SPECIES OF GENUS *BACTROCERA*

1. Costal band absent *nigra* (some specimens)
- Costal band present 2
- 2(1). Wings with infuscation in addition to costal band and anal streak (may be narrow infuscation along 1 or both crossveins) 3
- Wings colourless except for costal band and anal streak 71
- 3(2). Wings with an isolated apical fuscous spot or with at least apical $\frac{1}{2}$ infuscated and not marked with a distinct pattern of transverse fuscous bands 4
- Wings marked with a distinct pattern of transverse fuscous bands 15
- 4(3). Facial spots absent 5
- Facial spots present 8
- 5(4). Lateral postsutural vittae absent *ebenea*
- Lateral postsutural vittae present 6
- 6(5). Medial postsutural vitta absent *fuscata*
- Medial postsutural vitta present 7
- 7(6). Supra-alar bristles absent; medial postsutural vitta short and broad *tigrina* (males)
- Supra-alar bristles present; medial postsutural vitta long and narrow *penefurva*
- 8(4). Mesonotum basically red-brown; prsc. bristles present or absent 9
- Mesonotum black; prsc. bristles absent 11
- 9(8). Medial postsutural vitta absent; apical $\frac{1}{2}$ of wing fuscous; sa. and prsc. bristles present *amplexiseta*
- Medial postsutural vitta present; wing with a general fuscous colouration; sa. bristles present or absent; prsc. bristles absent 10
- 10(9). Lateral postsutural vittae present; sa. bristles absent *neopagdeni*
- Lateral postsutural vittae absent; sa. bristles present *salamander*
- 11(8). Medial postsutural vitta absent; sa. bristles present 12
- Medial postsutural vitta present; sa. bristles present or absent 13
- 12(11). Abdominal terga III-V orange-brown with broad medial and lateral longitudinal black bands joined by black across most of tergum V; dense microtrichia covering all of second costal cell and most of first costal cell *honiarae*
- Abdominal terga III-V uniformly black; microtrichia in outer $\frac{1}{2}$ of second costal cell only *pepisalae*
- 13(11). Supra-alar bristles absent *pagdeni*
- Supra-alar bristles present 14
- 14(13). Abdominal terga III-V mostly black except dark fuscous centrally on terga III and V surrounding a medial longitudinal black band; costal cells with a pale fuscous tint *surrufula*
- Abdominal terga II-IV orange-brown except fuscous laterally and posteriorly and tergum V entirely fuscous; costal cells colourless *emarginata*
- 15(3). Medial postsutural vitta present 16
- Medial postsutural vitta absent 37
- 16(15). Prescutellar bristles absent; sa. bristles present or absent 17
- Prescutellar and sa. bristles present 24
- 17(16). Supra-alar bristles absent *visenda*
- Supra-alar bristles present 18
- 18(17). 4 scutellar bristles present; lateral postsutural vittae present 19
- 2 scutellar bristles present; lateral postsutural vittae present or absent 20
- 19(18). A broad U-shaped fuscous band across wing; microtrichia covering most of second costal cell; mesopleural stripe extending to humeral callus above; apical segment of ovipositor (aculeus) needle shaped at its tip *perplexa*
- An S-shaped pale fuscous band of irregular outline across wing; microtrichia in outer $\frac{1}{3}$ of second costal cell; mesopleural stripe not extending to humeral callus above; apical segment of ovipositor (aculeus) with 1 pair of subapical lobes *decipiens*
- 20(18). Lateral postsutural vittae present 21
- Lateral postsutural vittae absent 22

- 21(20). A broad U-shaped fuscous band across wing; mesonotum mostly black; lateral postsutural vittae very narrow *sepikae*
 Infuscation only on dm-cu crossvein; mesonotum red-brown with dark patterns; lateral postsutural vittae broad *strigifinis*
- 22(20). Mesonotum black; humeral and notopleural calli not joined by a broad yellow band *singularis*
 Mesonotum red-brown or orange-brown; humeral and notopleural calli joined by a broad yellow band 23
- 23(22). Mesonotum entirely red-brown; humeral and notopleural calli entirely yellow; scutellum yellow with pale fuscous on apex; medial postsutural vitta pointed anteriorly and rounded posteriorly; mesopleural stripe not extending to humeral callus above; wing with narrow, pale infuscations around crossveins; abdominal terga red-brown with an oval dark fuscous to black spot in centre of tergum V *univittata*
 Mesonotum mostly fulvous; posterior $\frac{1}{3}$ humeral calli and anterior $\frac{1}{2}$ notopleural calli yellow (remainder fulvous); scutellum yellow with fulvous on apex; medial postsutural vitta short and triangular; mesopleural stripe extending to humeral callus above; wing with a transverse fuscous band running from R₄₊₅ to enclose dm-cu crossvein and continuing around wing margin to extremity of A₁ + CuA₂, a transverse fuscous band enclosing r-m crossvein and continuing across discoidal cell; abdomen fulvous with a black spot in centre of tergum V *triangularis*
- 24(16). 2 scutellar bristles present 25
 4 scutellar bristles present 28
- 25(24). A single transverse fuscous band across wing; costal cells pale fuscous with microtrichia covering all of first and most of second costal cell; mesonotum mostly fuscous or .. black 26
 Infuscation on 1 or both crossveins; costal cells colourless with microtrichia in outer corner of second costal cell only; mesonotum most red-brown 27
- 26(25). Mesonotum fuscous; abdominal terga III-V orange-brown with broad lateral longitudinal fuscous bands *cheesmanae*
 Mesonotum mostly black; abdominal terga III-V with at most narrow fuscous lateral margins *neochesmanae*
- 27(25). Costal band not expanded at apex of wing; infuscation on dm-cu crossvein; mesopleural stripe extending to humeral callus above *bullata*
 Costal band expanded into distinct spot at apex of wing; narrow fuscous tint on r-m crossvein and dark fuscous on dm-cu crossvein; mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle....*cucurbitae* (some specimens)
- 28(24). Humeral and notopleural calli joined by a broad yellow band *unilateralis*
 Humeral and notopleural calli not joined by a yellow band 29
- 29(28). Wing with an S- or Z-shaped fuscous band in addition to costal band and anal streak; notopleural calli yellow or mainly black 30
 Wing with infuscation only on 1 or both crossveins in addition to costal band and anal streak; notopleural calli yellow 32
- 30(29). An S-shaped fuscous band across wing, connected to costal band in only 1 position (at the r-m crossvein); mesonotum black with large brown markings; notopleural calli yellow; abdomen with a broad medial and 2 broad lateral longitudinal black bands on terga III-V and without a transverse black band across base of tergum III *gracilis*
 A Z-shaped dark fuscous band across wing, connected to costal band in 2 positions; mesonotum glossy black; notopleural calli yellow or mostly black; abdomen with a broad medial and 2 broad lateral longitudinal black bands on terga III-V and with or without a transverse black band across base of tergum III 31
- 31(30). Notopleural calli yellow; lateral postsutural vittae ending at upper pa. bristles; mesopleural stripe not extending to humeral callus above; microtrichia in outer portion of second costal cell only; abdomen without a transverse black band across base of tergum III *amoena*
 Notopleural calli black with yellow spot on apex; lateral postsutural vittae ending behind upper pa. bristles; mesopleural stripe extending to humeral callus above; microtrichia

- covering all of second costal cell; abdomen with a transverse black band across base of tergum III *reflexa*
- 32(29). Costal band expanded into a distinct dark fuscous spot at apex of wing; usually with a broad dark fuscous band along dm-cu crossvein; mesonotum mostly red-brown; abdominal terga with ground colour orange-brown 33
- Costal band only slightly widened at apex of wing; a narrow and usually pale infuscation along dm-cu crossvein; mesonotum black or red-brown with a pattern of dark markings; abdominal terga with ground colour fulvous 34
- 33(32). Spot on apex of wing not reaching M; narrow tint of fuscous colouration along r-m crossvein; costal cells colourless; abdominal tergum III with a narrow transverse black band across base, a narrow medial longitudinal dark fuscous to black band on terga III-V, dark fuscous to black on anterolateral corners of terga IV and V; aculeus needle shaped at apex *cucurbitae* (some specimens)
- Spot on apex of wing overlapping M, sometimes connected to infuscation along dm-cu crossvein; sometimes with a broad fuscous band along r-m crossvein; costal cells pale fulvous; abdominal tergum III with a moderately broad dark fuscous to black band across base, terga IV and V with a moderately broad medial longitudinal dark fuscous band and without dark colouration on anterolateral corners; aculeus with a pair of subapical lobes *emittens*
- 34(32). Wing with infuscation along r-m crossvein; costal cells fulvous; mesonotum red-brown with large black markings; abdomen elongate, with a black transverse band across base of tergum III in addition to a broad medial and 2 broad lateral longitudinal dark fuscous to black bands over terga III-V *abdoangusta*
- Wing without infuscation along r-m crossvein; costal cells extremely pale fulvous; mesonotum either red-brown with small fuscous markings or black with irregular red-brown and brown markings; abdomen short or elongate-oval, uniformly orange-brown with 3 longitudinal dark bands on terga III-V; with or without a black band across base of tergum III 35
- 35(34). Abdominal terga uniformly orange-brown *anchitrichota*
- Abdominal terga III-V with 3 longitudinal dark bands and with or without a black band across base of tergum III 36
- 36(35). Wing membrane colourless; mesonotum red-brown with a pattern of small fuscous markings; abdomen elongate-oval, with a black transverse band across base of tergum III *chorista*
- Wing membrane with a pale fulvous tint; mesonotum black with irregular red-brown and brown markings; abdomen short, without a black transverse band across base of tergum III *curta*
- 37(15). Infuscation only on 1 or both crossveins 38
- Infuscation as 1 or more transverse bands extending from costal band to hind margin of wing, as a broad medial band or a recurved band across central portion of wing 51
- 38(37). Lateral postsutural vittae absent 39
- Lateral postsutural vittae present 42
- 39(38). Scutellum and notopleural calli entirely black *melanotus*
- Scutellum and notopleural calli yellow 40
- 40(39). Infuscation on dm-cu and r-m crossveins; abdominal terga I-IV mostly dark fuscous to black and tergum V orange-brown *invisitata*
- Infuscation on r-m crossvein; terga I-V generally pale coloured 41
- 41(40). Yellow triangular marking above notopleural callus; costal band confluent with R₄₊₅; mesonotum red-brown; abdominal terga III-V red-brown with a medial and 2 broad lateral longitudinal fuscous bands *aneuvittata*
- No yellow triangular marking above notopleural callus; costal band confluent with R₂₊₃; mesonotum black; abdominal terga I-V uniformly red-brown *exigua*
- 42(38). Scutellum yellow with apical ½ fuscous *brunnea*
- Scutellum yellow or yellow with black markings 43
- 43(42). Scutellum yellow with a broad black triangular marking on dorsal surface 44
- Scutellum entirely yellow 46

- 44(43). Costal band confluent with R_{4+5} ; abdominal terga II-V orange-brown with lateral and medial longitudinal black bands joined along base of tergum II *melanoscutata*
 Costal band narrow (not overlapping R_{2+3}); abdominal terga black 45
- 45(44). Face black; costal band narrow (not overlapping R_{2+3}) and fuscous; r-m crossvein longer than dm-cu crossvein; a narrow infuscation along r-m crossvein which becomes paler as it extends to dm-cu crossvein; legs with all tibiae, apices of femora and apical 4 segments of tarsi fuscous; lateral postsutural vittae very short and narrow, ending just behind sa. bristles *obliqua*
 Face fulvous (with a pair of small pale spots in 75 percent of specimens); costal band narrow (not overlapping R_{2+3}) and pale fuscous; r-m crossvein shorter than dm-cu crossvein; infuscation around crossveins very narrow and pale; legs entirely fulvous; lateral postsutural vittae long, ending before upper pa. bristles *psidii*
- 46(43). Mesonotum orange-brown or dark fuscous 47
 Mesonotum black 48
- 47(46). Mesonotum and abdomen mostly orange-brown; notopleural calli fuscous; dm-cu crossvein infuscated; costal cells colourless *hispidula*
 Mesonotum and abdomen mostly dark fuscous; notopleural calli yellow; r-m crossvein infuscated; costal cells pale fuscous *laticaudus*
- 48(46). Costal cells colourless; legs with some segments dark coloured; abdominal terga III-V mostly black 49
 Costal cells coloured; legs mostly fulvous; abdominal terga III-V with ground colour orange-brown 50
- 49(48). Lateral postsutural vittae broad and ending at upper pa. bristles *neonigrita*
 Lateral postsutural vittae short and narrowing posteriorly to end well before upper pa. bristles *melanogaster*
- 50(48). Mesopleural stripe not extending to humeral callus above; microtrichia covering all of second costal cell and outer corner of first costal cell; legs fulvous, hind tibiae dark fulvous; abdominal tergum III with a very narrow transverse fuscous band across anterior margin and merging into broad lateral black margins, the anterolateral corners of terga IV and V fuscous *curvipennis*
 Mesopleural stripe extending to humeral callus above; microtrichia in second costal cell only; legs entirely fulvous; abdominal tergum III with a black band across anterior margin and expanding laterally to cover outer margins of tergum III and anterolateral corners of tergum IV, a broad medial longitudinal black band on terga III-V *phaea*
- 51(37). Scutellum yellow with a large fuscous or black triangular marking on dorsal surface.... 52
 Scutellum entirely yellow with, at most, a small fuscous marking on apex 59
- 52(51). Costal band very pale and indistinct beyond extremity of R_1 ; a narrow transverse fuscous band across wing, just enclosing both crossveins *frauenfeldi* complex (see key page 238)
 Costal band distinct beyond extremity of R_1 ; infuscation as 1 or 2 transverse bands or U- or Z-shaped markings 53
- 53(52). Mesonotum red-brown; a broad fuscous medial longitudinal band on scutellum; a narrow transverse fuscous band across wing *strigata*
 Mesonotum black; a black medial longitudinal band on scutellum, infuscation across wing as 1 or 2 transverse bands or as a U- or Z-shaped band 54
- 54(53). 1 or 2 transverse fuscous bands across wing from costal band to hind margin (1 may be recurved if 2 present) 55
 A U- or Z-shaped fuscous band across wing 58
- 55(54). 2 transverse fuscous bands across wing from costal band to hind margin 56
 1 narrow transverse fuscous band across wing from costal band to hind margin 57
- 56(55). Mesopleural stripe extending to humeral callus above; neither of the transverse fuscous bands across wing are recurved back from hind margin; lateral postsutural vittae broad and ending at level of pa. bristles *lampabilis*
 Mesopleural stripe not extending to humeral callus above; the transverse fuscous band across centre of wing recurved back along CuA_1 ; lateral postsutural vittae narrow and ending

- before upper pa. bristles *longicornis*
- 57(55). Abdominal terga black; humeral calli black around anterior and dorsal margins; costal cells with a pale fuscous tint; costal band confluent with R_{2+3} *unilineata*
Abdominal terga II-V orange-brown with a medial and 2 broad lateral longitudinal black bands; humeral calli entirely yellow; costal cells fuscous; costal band overlapping R_{2+3} *angustifasciata*
- 58(54). A broad wedge shaped fuscous marking enclosing r-m crossvein and a Z-shaped fuscous band across wing *ismayi*
A U-shaped fuscous band across wing, enclosing both crossveins and recurving back along CuA_1 *reclinata*
- 59(51). Wing with 3 distinct transverse fuscous bands *umbrosa*
Wing not so marked 60
- 60(59). Lateral postsutural vittae absent 61
Lateral postsutural vittae present 62
- 61(60). Costal cells fuscous; a narrow transverse fuscous band across wing enclosing both crossveins; humeral calli yellow; abdominal terga uniformly dark fuscous *pisinna*
Costal cells colourless; a broad dark fuscous blotch across wing enclosing both crossveins and most of discoidal cell; humeral calli black; abdominal terga uniformly black *retrorsa*
- 62(60). 2 transverse fuscous bands across wing from costal band to hind margin 63
1 transverse fuscous band across wing or a U-, S- or Z-shaped fuscous band from costal band to hind margin 65
- 63(62). Transverse fuscous band across centre of wing as a broad irregular blotch enclosing both crossveins and at least distal $\frac{2}{3}$ of discoidal cell 64
Transverse fuscous band across centre of wing narrow, covering approximately distal $\frac{1}{3}$ of discoidal cell and recurving back along posterior side of CuA_1 *alyxiae* complex (see key page 234)
- 64(63). Mesopleural stripe extending to humeral callus above; costal cells fuscous (second cell colourless in centre); abdominal terga II-V fulvous with a broad medial longitudinal black band on all 4 terga and 2 broad lateral longitudinal black bands on terga III-V *seguyi*
Mesopleural stripe extending to anterior npl. bristle above; costal cells fulvous; abdominal terga III-V uniformly dark brown *curvifera*
- 65(62). A U-, S- or Z-shaped fuscous band across wing .. *recurrens* complex (see key page 239)
A single transverse fuscous band across wing 66
- 66(65). 4 scutellar bristles present 67
2 scutellar bristles present 69
- 67(66). Transverse band across wing extending from costal band to hind margin; abdominal terga uniformly black *coracinus*
Transverse band across wing broad and running from R_{4+5} to hind margin; abdominal terga mostly orange-brown 68
- 68(67). Humeral bristles absent; scutellum with apical $\frac{1}{2}$ fuscous; mesonotum red-brown *aurea*
Humeral bristles present; scutellum entirely yellow; mesonotum black *dissidens*
- 69(66). Transverse fuscous band across wing narrow, enclosing both crossveins and, at most, outer $\frac{1}{3}$ of discoidal cell *distincta* and *fulvicauda* complexes (see key page 236)
Transverse band across wing as a broad dark fuscous marking covering most of wing, enclosing both crossveins and more than outer $\frac{1}{2}$ of discoidal cell 70
- 70(69). Abdominal terga uniformly black; mesopleural stripe narrow, only slightly wider than notopleural callus above *biarcuata*
Abdominal terga III-V orange-brown with a broad medial and 2 broad lateral longitudinal black bands over all 3 terga and joining along posterior margin of tergum V; mesopleural stripe extending to anterior npl. bristle *confluens*
- 71(2). Lateral and medial postsutural vittae present 72
Lateral postsutural vittae present or absent, medial postsutural vitta absent 99
- 72(71). 4 scutellar bristles present 73

	2 scutellar bristles present	92
73(72).	Prescutellar bristles absent	74
	Prescutellar bristles present	79
74(73).	Supra-alar bristles absent	75
	Supra-alar bristles present	77
75(74).	Costal cells colourless	<i>neopallescentis</i> (some specimens)
	Costal cells pale fulvous or pale fuscous	76
76(75).	Lateral postsutural vittae broad, parallel sided and ending behind upper pa. bristles; apex of piercer of ovipositor with a pair of subapical keels and with sensory setae close to apex	<i>cucumis</i>
	Lateral postsutural vittae narrowing to end before upper pa. bristles; apex of piercer of ovipositor needle shaped and with sensory setae situated well back from apex	<i>signatifera</i> (some specimens)
77(74).	Mesonotum orange-brown; humeral and notopleural calli joined by a lateral yellow band	<i>citroides</i>
	Mesonotum black; humeral and notopleural calli not joined by a lateral yellow band	78
78(77).	Lateral postsutural vittae broad and ending at upper pa. bristles; costal band overlapping R_{2+3}	<i>abdoaurantiaca</i>
	Lateral postsutural vittae narrow and ending before upper pa. bristles; costal band confluent with R_{2+3}	<i>aurantiventer</i>
79(73).	Supra-alar bristles absent	<i>neopallescentis</i> (some specimens)
	Supra-alar bristles present	80
80(79).	Face entirely dark fuscous to black	81
	Face fulvous with or without dark spots	84
81(80).	Mesonotum mostly red-brown	<i>fallacis</i>
	Mesonotum mostly black	82
82(81).	Lateral postsutural vittae beginning at mesonotal suture; costal cells colourless	<i>exornata</i>
	Lateral postsutural vittae beginning anterior to mesonotal suture; costal cells pale fuscous	83
83(82).	Abdominal terga orange-brown with a dark fuscous spot in centre of tergum V	<i>brachus</i>
	Abdominal terga III-V with broad medial and lateral longitudinal dark fuscous to black bands	<i>daula</i>
84(80).	Facial spots absent	<i>alampeta</i>
	Facial spots present (but sometimes small and pale)	85
85(84).	Mesonotum black	<i>timorensis</i>
	Mesonotum mostly red-brown	86
86(85).	Yellow triangular marking above notopleural callus; medial postsutural vitta elongate, reaching to level of anterior npl. bristle	<i>macrovittata</i>
	No yellow triangular marking above notopleural callus (at most lateral postsutural vittae extending anterior to mesonotal suture); medial postsutural vitta reaching to level of mesonotal suture	87
87(86).	Costal band broad, confluent or almost confluent with R_{4+5}	88
	Costal band narrow, not confluent with R_{4+5}	89
88(87).	Mesopleural stripe narrow, reaching midway between anterior margin of notopleural callus and anterior npl. bristle; costal cells with a pale fulvous tint	<i>sandaracina</i>
	Mesopleural stripe broad, reaching midway between anterior npl. bristle and humeral callus; costal cells pale fuscous	<i>mesonotaita</i>
89(87).	Costal band overlapping R_{2+3}	90
	Costal band confluent with R_{2+3}	91
90(89).	Costal cells pale fulvous; abdominal terga II-V orange-brown with fuscous to black across anterior margin of tergum II, fuscous on lateral margins of tergum III and a narrow medial fuscous band on tergum V	<i>atrisetosa</i>
	Costal cells almost colourless; abdominal terga orange-brown without a dark band across	

	anterior margin of tergum II and with a narrow medial longitudinal dark fuscous to black band on tergum V and posterior $\frac{1}{2}$ of tergum IV	<i>trichota</i>
91(89).	Costal cells fulvous; coloured tint in wing membrane; lateral postsutural vittae not extending anterior to mesonotal suture; abdominal terga III-V fulvous with red-brown medial and lateral longitudinal bands	<i>aglaiae</i>
	Costal cells colourless; wing membrane colourless; lateral postsutural vittae extending anterior to mesonotal suture; abdominal terga uniformly orange-brown	<i>unichromata</i>
92(72).	Prescutellar bristles present	93
	Prescutellar bristles absent	95
93(92).	Supra-alar bristles absent	<i>tigrina</i> (females)
	Supra-alar bristles present	94
94(93).	Notopleural calli orange-brown; humeral and notopleural calli joined by a lateral yellow band; scutellum orange-brown with lateral yellow margins	<i>xanthodes</i>
	Notopleural calli with posterior $\frac{1}{2}$ yellow and anterior $\frac{1}{2}$ black; humeral and notopleural calli not joined by a yellow band; scutellum yellow	<i>eximia</i>
95(92).	Supra-alar bristles absent	96
	Supra-alar bristles present	97
96(95).	Humeral and notopleural calli joined by a lateral yellow band; costal band confluent with R_{4+5} ; abdominal terga III-V orange-brown with a narrow transverse fuscous band across anterior margin of tergum III, lateral margins of tergum III and anterolateral corners of terga IV and V fuscous	<i>mesonotochra</i>
	Humeral and notopleural calli not joined by a yellow band; costal band confluent with R_{2+3} ; abdominal terga uniformly orange-brown with a black spot centrally on tergum V	<i>signatifer</i> (some specimens)
97(95).	Humeral and notopleural calli joined by a lateral yellow band; lateral postsutural vittae beginning anterior to mesonotal suture	<i>buvittata</i>
	Humeral and notopleural calli not joined by a yellow band; lateral postsutural vittae beginning at or behind mesonotal suture	98
98(97).	Mesonotum black; lateral postsutural vittae very short and ending at level of sa. bristles	<i>paulula</i>
	Mesonotum basically red-brown; lateral postsutural vittae ending at a level between sa. and upper pa. bristles	<i>angusticostata</i>
99(71).	Lateral postsutural vittae absent	100
	Lateral postsutural vittae present	119
100(99).	4 scutellar bristles	101
	2 scutellar bristles	103
101(100).	Facial spots present	<i>nigra</i>
	Facial spots absent	102
102(101).	Legs entirely fulvous; a broad medial longitudinal black band on scutellum	<i>fulvifacies</i>
	Legs fulvous with apical $\frac{1}{3}$ of mid and hind femora black, mid tibiae fuscous and hind tibiae dark fuscous; a black triangle on scutellum with apex in centre	<i>abdomininigra</i>
103(100).	Scutellum entirely black or with a large black triangular marking on dorsal surface ...	104
	Scutellum yellow with a narrow black basal band and sometimes with pale fuscous on apex	109
104(103).	Scutellum entirely black	105
	Scutellum yellow with a large black triangular marking on dorsal surface	106
105(104).	Facial spots present	<i>atra</i>
	Facial spots absent	<i>perfusca</i>
106(104).	Humeral calli black	107
	Humeral calli yellow with, at most, anterolateral corners black	108
107(106).	Supra-alar bristles present	<i>morula</i>
	Supra-alar bristles absent	<i>hypomelaina</i>
108(106).	Notopleural calli black; facial spots absent	<i>setinervis</i>

	Notopleural calli yellow; facial spots present	<i>kirki</i>
109(103).	Humeral calli fuscous to black	110
	Humeral calli yellow	113
110(109).	Supra-alar bristles absent	<i>minuta</i>
	Supra-alar bristles present	111
111(110).	Facial spots present; fore and mid femora black, apical $\frac{1}{2}$ hind femora black, fore and mid tibiae fuscous, hind tibiae dark fuscous	<i>thistletoni</i>
	Facial spots absent; legs mostly fulvous	112
112(111).	Abdominal terga mostly black	<i>passiflorae</i>
	Abdominal tergum I black, terga II-V orange-brown with a medial dark fuscous band over terga III-V and 2 broad lateral glossy black bands over terga II-V	<i>samoae</i>
113(109).	Mesonotum red-brown	114
	Mesonotum black	115
114(113).	Notopleural calli yellow; mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle; yellow triangular marking along mesonotal suture; scutellum yellow with fuscous spot on apex; costal cells fuscous	<i>mendosa</i>
	Notopleural calli shining orange-brown; mesopleural stripe reaching humeral callus; no yellow triangular marking along mesonotal suture; scutellum entirely yellow; costal cells colourless	<i>luteola</i>
115(113).	Prescutellar bristles absent	<i>perpusilla</i>
	Prescutellar bristles present	116
116(115).	Abdominal terga uniformly black	117
	Abdominal terga orange-brown with dark markings	118
117(116).	Costal cells pale fulvous; legs fuscous except fore tibiae fulvous	<i>exspoliata</i>
	Costal cells colourless; legs with femora black except basal $\frac{2}{3}$ hind femora fulvous, fore tibiae fuscous, mid and hind tibiae dark fuscous	<i>diospyri</i>
118(116).	Scutellum yellow with fuscous spot on apex; costal cells extremely pale fulvous; abdominal terga III-V orange-brown with a transverse dark fuscous spot on lateral margins of each tergum, a narrow medial longitudinal band which is fuscous to dark fuscous on terga III and IV and black on tergum V	<i>obscura</i>
	Scutellum entirely yellow; costal cells pale fuscous; abdominal terga III-V red-brown with broad fuscous lateral margins on tergum III, narrow fuscous lateral margins on terga IV and V and a narrow medial longitudinal fuscous to dull black band on terga III-V	<i>allwoodi</i>
119(99).	4 scutellar bristles present	120
	2 scutellar bristles present	123
120(119).	Face black; lateral postsutural vittae short and narrow, ending at or before sa. bristles; wing without distinct costal band on entire margin; scutellum entirely yellow or yellow with black markings	121
	Face fulvous with a pair of black spots; lateral postsutural vittae long, ending at or before upper pa. bristles; wing with distinct costal band along entire margin; scutellum entirely yellow	122
121(120).	Scutellum yellow with a broad medial black band on dorsal surface; mesopleural stripe ending just before humeral callus above; humeral calli glossy black	<i>satanellus</i>
	Scutellum entirely yellow; mesopleural stripe extending to humeral callus above; humeral calli yellow with anterodorsal corners black	<i>terminifera</i>
122(120).	Mesonotum black; abdominal terga III-V black except for orange-brown bordering a medial longitudinal fuscous band on posterior regions of each tergum (on tergum V the orange-brown spreads along posterior margin); legs with basal $\frac{1}{2}$ hind femora fulvous (remainder of all femora fuscous), fore tibiae fuscous, mid tibiae fulvous, hind tibiae dark fuscous, tarsi fulvous	<i>quadrisetosa</i>
	Mesonotum red-brown; legs entirely fulvous; abdominal terga III-V orange-brown with a small fuscous spot laterally on anterior margin of tergum III, a narrow medial longitudinal fuscous band running over tergum V and posterior $\frac{1}{2}$ of tergum IV	<i>expandens</i>
123(119).	Costal band broad, extending to or below R ₄₊₅ for its entire length	124

- Costal band narrow, not extending to R₄₊₅ except beyond extremity of R₂₊₃ 127
- 124(123). Mesonotum red-brown to fuscous *furforosa* and *notatagena* complexes (see key page 238)
Mesonotum black 125
- 125(124). Abdominal terga III-V fulvous with a broad medial and 2 broad lateral longitudinal black bands not meeting along anterior margin of tergum III *froggatti*
Abdominal terga either uniformly orange-brown or black, or with terga III-V orange-brown with medial and lateral longitudinal bands which join along tergum III 126
- 126(125). Pecten absent on abdominal tergum III of male *calophylli*
Pecten present on abdominal tergum III of male .. *bryoniae* complex (see key page 236)
- 127(123). Humeral and notopleural calli joined by a broad yellow band 128
Humeral and notopleural calli not joined by a broad yellow band 130
- 128(127). Supra-alar bristles absent *jarvisi*
Supra-alar bristles present 129
- 129(128). Mesopleural stripe not extending to humeral callus above; anterior ½ notopleural calli fuscous (remainder yellow); lateral postsutural vittae beginning anterior to mesonotal suture; microtrichia covering all of second costal cell and outer corner of first costal cell. *diaphana*
Mesopleural stripe extending to humeral callus above; notopleural calli entirely yellow; lateral postsutural vittae beginning at mesonotal suture; microtrichia in outer corner of second costal cell only *ochromarginis*
- 130(127). Scutellum either entirely brown or black, or yellow with a very broad basal band usually as a black or brown triangular marking on dorsal surface 131
Scutellum yellow with a moderately narrow black basal band, or sometimes with fuscous on apex or mostly orange-brown 139
- 131(130). Scutellum entirely brown or black 132
Scutellum yellow with a broad basal band or a large black or brown triangular marking on dorsal surface 133
- 132(131). Scutellum entirely red-brown; humeral calli yellow (except anterior ⅓ brown) notopleural calli red-brown; facial spots absent; mesonotum and abdomen uniformly dark orange-brown *phaleriae*
Scutellum entirely black; humeral and notopleural calli black; facial spots present; mesonotum and abdomen entirely black *carbonaria*
- 133(131). Scutellum yellow with a broad basal band, ¼-½ width of scutellum *fagraea* complex (see key page 237)
Scutellum yellow with a medial longitudinal fuscous or black band 134
- 134(133). Mesonotum black or almost so 135
Mesonotum red-brown with or without dark markings 137
- 135(134). Abdomen orange-brown with a broad medial and 2 broad lateral longitudinal black bands over terga I-V; costal cells pale fulvous *trifaria*
Abdomen uniformly black; costal cells colourless 136
- 136(135). A large species (wing length 7.0 mm); humeral calli dark fuscous; lateral postsutural vittae narrow; longitudinal black band on scutellum narrow; legs with mid femora, apical ½ of hind femora and hind tibiae fuscous; wing with costal band present *atramentata*
A small species (wing length 5.0 mm); humeral calli glossy black with at most, a fulvous band through centre; lateral postsutural vittae broad; longitudinal black band on scutellum broad; legs with mid and hind femora and hind tibiae black; wing with costal band absent *picea*
- 137(134). Humeral calli brown; costal cells pale fulvous *enochra*
Humeral calli yellow; costal cells fuscous 138
- 138(137). Lateral postsutural vittae parallel sided and reaching upper pa. bristles; mesonotum red-brown without dark markings *daruensis*
Lateral postsutural vittae tapering and ending well before upper pa. bristles; mesonotum red-brown with irregular fuscous markings *buinensis*
- 139(130). Scutellum and notopleural calli entirely orange-brown *aenigmatica*
Scutellum entirely yellow or with dark markings on apex; notopleural calli yellow... 140

- 140(139). Scutellum yellow with fuscous on apex *bancroftii* (some specimens)
Scutellum entirely yellow with a narrow dark basal band 141
- 141(140). Supra-alar bristles absent 142
Supra-alar bristles present 149
- 142(141). Prescutellar bristles present 143
Prescutellar bristles absent 147
- 143(142). Mesonotum black 144
Mesonotum orange-brown or red-brown 145
- 144(143). Costal band confluent with R₂₊₃; mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle; black transverse band across anterior margin of abdominal tergum III *aberrans*
Costal band overlapping R₂₊₃; mesopleural stripe reaching to anterior npl. bristle; no dark transverse band across base of abdominal tergum III *melanothoracica*
- 145(143). Facial spots absent *mutabilis* (some specimens)
Facial spots present 146
- 146(145). Microtrichia covering all of second costal cell and outer ½ of first costal cell; lateral postsutural vittae ending at upper pa. bristles; mesopleural stripe reaching to anterior npl. bristle *ochracea*
Microtrichia in outer corner of second costal cell only; lateral postsutural vittae ending well before upper pa. bristles; mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle *unirufa*
- 147(142). Mesonotum and humeral calli black *toxopeusi*
Mesonotum red-brown; humeral calli yellow 148
- 148(147). Lateral postsutural vittae ending before upper pa. bristles; apex of piercer of ovipositor with 3 pairs of subapical lobes *decurtans*
Lateral postsutural vittae ending at upper pa. bristles; apex of piercer of ovipositor needle shaped *murrayi*
- 149(141). Mesonotum either mostly black or with definite dark fuscous to black patterns 150
Mesonotum mostly red-brown or orange-brown with or without small indistinct dark markings 160
- 150(149). Abdomen mostly black with, at most, pale colouration posteriorly on tergum II and posterocentrally on tergum V 151
Abdomen of uniform pale colouration or with a pattern of dark markings 152
- 151(150). Humeral calli dark brown or black *lineata*
Humeral calli yellow *anthracina* and *nigella* complexes (see key page 234)
- 152(150). Abdomen with at least terga III-V orange-brown or red-brown with, at most, pale fuscous narrow lateral margins and/or a narrow pale fuscous medial longitudinal band on I or all 3 terga 153
Abdominal terga III-V orange-brown with dark markings 154
- 153(152). Lateral postsutural vittae beginning anterior to mesonotal suture; prsc. bristles absent *abdopallescens*
Lateral postsutural vittae beginning at mesonotal suture; prsc. bristles present *assita* and *musae* complexes (see key page 234)
- 154(152). Lateral postsutural vittae very short, not extending posteriorly past sa. bristles 155
Lateral postsutural vittae long, always extending posteriorly of sa. bristles 156
- 155(154). Abdomen broadly black on lateral margins of tergum III and on anterolateral corners of terga IV and V, a moderately broad medial longitudinal black band on terga III-V; lateral postsutural vittae short and narrow, ending at level of sa. bristles *facialis*
Abdominal terga III-V with 2 broad lateral longitudinal black bands; lateral postsutural vittae short, ending just behind level of sa. bristles *mucronis*
- 156(154). Costal cells colourless to very pale fulvous *aemula* and *dorsalis* complexes (see key page 233)
Costal cells pale fuscous to fuscous, or if colourless then the abdominal terga are entirely fuscous with orange-brown posterocentrally on terga IV and V 157
- 157(156). Costal cells colourless *furvescens*

- Costal cells pale fuscous to fuscous 158
- 158(157). Costal band overlapping R_{2+3} ; abdominal terga III-V black with orange-brown posterocentrally on terga IV and V, mesonotum black with a broad dark fuscous longitudinal band anterocentrally *petila*
- Costal band confluent with R_{2+3} ; abdominal terga III-V with broad medial and lateral longitudinal dark bands; mesonotum entirely black 159
- 159(158). Costal cells fuscous (second cell paler) with microtrichia in outer corner of second costal cell only; lateral postsutural vittae ending before upper pa. bristles; scutellum yellow with a broad basal band; mesopleural stripe narrow (equal in width to notopleural callus); legs with femora entirely fulvous *congener*
- Costal cells pale fuscous with dense microtrichia covering second costal cell and outer $\frac{1}{2}$ of first costal cell; lateral postsutural vittae ending at upper pa. bristles; scutellum yellow with a narrow basal band; mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle); legs with apices of femora fuscous *buloloensis*
- 160(149). Microtrichia covering most of second costal cell and a portion of first costal cell ... 161
- Microtrichia confined to apical portion of second costal cell only 164
- 161(160). Facial spots absent *mutabilis* (some specimens)
- Facial spots present 162
- 162(161). All abdominal terga shining orange-brown with a large circular black spot on the anterocentral margin of tergum V *unipunctata*
- Abdomen with terga III-V either red-brown or fuscous with a pattern of darker markings 163
- 163(162). Costal cells fulvous; abdominal terga III-V with broad lateral longitudinal fuscous to red-brown bands; a small species *humilis*
- Costal cells fuscous; abdominal terga III-V with broad lateral longitudinal fuscous to dark fuscous bands; larger species *tryoni* complex (see key page 240)
- 164(160). Abdominal terga of uniform pale colouration, without dark colour patterns 165
- Abdominal terga III-V either entirely black or pale coloured with a pattern of dark colouration 166
- 165(164). Abdomen entirely fuscous; lateral postsutural vittae ending before upper pa. bristles *abdofuscata*
- Abdomen entirely pale orange-brown; lateral postsutural vittae ending behind upper pa. bristles *dyscrita*
- 166(164). Abdominal terga III-V entirely black *abdonigella*
- Abdominal terga III-V not entirely black 167
- 167(166). No medial dark band on abdomen 168
- A well defined or indistinct medial dark band on abdomen, either as a band on terga III-V or as an elongated spot on 1 or 2 of these terga 170
- 168(167). Abdominal tergum III with red-brown to very pale fuscous areas on lateral margins *peninsularis* (some specimens)
- Abdomen with broad lateral longitudinal dark fuscous bands on terga III-V 169
- 169(168). Lateral postsutural vittae parallel sided and ending behind upper pa. bristles; mesopleural stripe almost reaching anterior npl. bristle; a large species (wing length greater than 5.0 mm) *barringtoniae*
- Lateral postsutural vittae narrow and tapering to end at upper pa. bristles; mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle; a small species (wing length less than 5.0 mm) *aithogaster*
- 170(167). Abdominal terga III-V with broad lateral longitudinal dark bands *silvicola* complex (see key page 240)
- Abdominal terga III-V with narrow lateral longitudinal dark bands or without dark lateral margins 171
- 171(170). Abdominal terga III-V with distinct, narrow lateral dark colour patterns on at least 1 of these terga 172
- Abdominal terga III-V without distinct lateral dark colour patterns 173
- 172(171). Abdominal tergum V with a pair of fuscous to black shining spots *perkinsi*

- Abdominal tergum V without dark shining spots *quadrata* complex (see key page 239)
- 173(171). Costal cells colourless *mayi* complex (see key page 238)
- Costal cells pale fulvous 174
- 174(173). Abdominal terga III-V with a narrow transverse black band across base of tergum III and
a medial longitudinal fuscous to black band on at least 1 tergum 175
- Abdominal terga III-V not so marked 176
- 175(174). A large species; apex of piercer of ovipositor with a pair of small subapical keels
..... *moluccensis*
- A small species; apex of piercer of ovipositor with 2 pairs of strong subapical keels
..... *rutila*
- 176(174). Mesonotum uniformly red-brown; abdominal tergum V without a pair of fuscous to black
shining spots *bidentata* complex (see key page 235)
- Mesonotum with a pair of longitudinal fuscous stripes; abdominal tergum V with or without
a pair of fuscous to black shining spots 177
- 177(176). Abdominal tergum V with a pair of dark shining spots; lateral postsutural vittae ending
at upper pa. bristles; mesopleural stripe reaching to anterior npl. bristle
..... *robiginosa*
- Abdominal tergum V without a pair of dark shining spots; lateral postsutural vittae ending
before upper pa. bristles; mesopleural stripe ending midway between anterior margin of
notopleural callus and anterior npl. bristle *hastigerina*

KEY TO SPECIES OF SUBGENUS *BACTROCERA* PLACED IN COMPLEXES**aemula and dorsalis complexes**

1. Lateral postsutural vittae ending before upper pa. bristles 2
- Lateral postsutural vittae ending at or behind upper pa. bristles 8
- 2(1). Costal cells colourless *endiandrae*
- Costal cells with a pale fulvous tint 3
- 3(2). Mesopleural stripe equal in width to notopleural callus *diallagma*
- Mesopleural stripe wider than notopleural callus 4
- 4(3). Mesopleural stripe reaching or anterior to anterior npl. bristle 5
- Mesopleural stripe ending midway between anterior margin of notopleural callus and anterior
npl. bristle 6
- 5(4). Mesopleural stripe reaching anterior npl. bristle *consectorata*
- Mesopleural stripe reaching almost to humeral callus *fuliginus*
- 6(4). Costal band confluent with R₂₊₃; pale infuscation covering wing membrane
..... *inconstans*
- Costal band overlapping R₂₊₃; wing membrane colourless 7
- 7(6). Costal band almost confluent with R₄₊₅; abdominal terga mostly orange-brown with narrow
medial and lateral longitudinal pale fuscous bands *mimulus*
- Costal band reaching midway between R₂₊₃ and R₄₊₅; abdominal terga mostly dark in
colour *aemula*
- 8(1). Costal cells colourless 9
- Costal cells with a pale fulvous tint 12
- 9(8). Mesonotum generally red-brown with a distinct black pattern 10
- Mesonotum entirely black 11
- 10(9). Costal band overlapping R₂₊₃ *opiliae*
- Costal band confluent with R₂₊₃ and widening slightly after crossing this vein
..... *cacuminata*
- 11(9). Prescutellar bristles absent; abdominal terga III-V orange-brown with a broad medial
longitudinal black band and moderately broad black lateral margins on tergum III .
..... *nigrescens*

- Prescutellar bristles present; abdominal terga III-V dark fuscous to black except orange-brown posterocentrally on tergum III and medially on terga IV and V *trivialis*
- 12(8). Mesopleural stripe reaching to anterior npl. bristle 13
 Mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle 14
- 13(12). Costal band overlapping R_{2+3} ; lateral postsutural vittae narrowing posteriorly; prsc. bristles present *vulgaris*
 Costal band confluent with R_{2+3} ; lateral postsutural vittae parallel sided; prsc. bristles absent *indecora*
- 14(12). Costal band almost confluent with R_{4+5} *laticosta*
 Costal band reaching midway between R_{2+3} and R_{4+5} 15
- 15(14). Abdomen oval; costal band expanded at apex of wing; lateral postsutural vittae narrowing to end at upper pa. bristles; abdominal terga III-V with a medial and 2 lateral longitudinal broad dark bands joined along anterior margin of tergum III *dapsiles*
 Abdomen elongate-oval; costal band of uniform width; lateral postsutural vittae parallel sided and ending behind upper pa. bristles; abdomen with a narrow medial longitudinal pale fuscous band on terga II-V and 2 moderately broad lateral longitudinal pale fuscous bands on terga III-V *abdominosa*

alyxiae complex

1. Mesonotum entirely black; abdominal terga III-V orange-brown with 2 broad lateral longitudinal fuscous bands *alyxiae*
 Mesonotum fuscous with 2 irregularly shaped lateral longitudinal black bands; abdominal terga III-V uniformly orange-brown except for a narrow transverse fuscous band anterolaterally on tergum III *repanda*

anthracina and nigella complexes

1. Costal cells colourless or almost colourless 2
 Costal cells fulvous or fuscous 4
- 2(1). Lateral postsutural vittae ending well before upper pa. bristles; mesopleural stripe reaching almost to humeral callus *aterrima*
 Lateral postsutural vittae ending at upper pa. bristles; mesopleural stripe not extending past midline between anterior margin of notopleural callus and anterior npl. bristle 3
- 3(2). Facial spots small and triangular; legs fulvous except hind tibiae fuscous *nigella*
 Facial spots large and oval; fore femora dark fuscous, mid femora and apical $\frac{1}{3}$ hind femora black; fore and mid tibiae fuscous, hind tibiae dark fuscous *terminaliae*
- 4(1). Microtrichia covering all of second and most of first costal cell 5
 Microtrichia in outer corner of second costal cell only 6
- 5(4). Lateral postsutural vittae narrow and ending well before upper pa. bristles; scutellum with a broad black basal band; mesopleural stripe not extending to humeral callus *caliginosa*
 Lateral postsutural vittae parallel sided and ending at upper pa. bristles; scutellum with a narrow dark basal band; mesopleural stripe extending to humeral callus *kelaena*
- 6(4). Lateral postsutural vittae narrowing sharply to end before upper pa. bristles; legs fulvous except hind tibiae fuscous *batemani*
 Lateral postsutural vittae broad and ending behind upper pa. bristles; legs with apices of all femora and all tibiae fuscous *anthracina*

assita and musae complexes

1. Notopleural calli with anterior $\frac{1}{2}$ black, posterior $\frac{1}{2}$ yellow; scutellum with a broad black basal band *robertsi*
 Notopleural calli entirely yellow; scutellum with a narrow dark basal band 2

- 2(1). Lateral postsutural vittae ending before upper pa. bristles 3
 Lateral postsutural vittae ending at upper pa. bristles 5
- 3(2). Costal cells pale fulvous; abdominal terga III-V orange-brown with narrow medial and lateral longitudinal pale fuscous to fuscous bands joined along anterior margin of tergum III *commina*
 Costal cells colourless; abdominal terga II-V mostly orange-brown 4
- 4(3). Costal band overlapping R_{2+3} ; abdomen elongate-oval with terga II-V uniformly orange-brown *prolixa*
 Costal band confluent with R_{2+3} ; abdomen oval with a narrow medial longitudinal fuscous band on tergum V *brevistriata*
- 5(2). Mesonotum with a distinct lanceolate black pattern interspersed with red-brown *musae* (some specimens)
 Mesonotum uniformly black 6
- 6(5). Costal cells colourless 7
 Costal cells coloured, at least by a pale fulvous tint 9
- 7(6). Costal band only just overlapping R_{2+3} and narrowing towards apex of wing; apex of piercer of ovipositor curved upwards, elongate and pointed sharply *tinomiscii*
 Costal band dark fuscous and distinct well below R_{2+3} ; apex of piercer of ovipositor not curved 8
- 8(7). Costal band overlapping R_{2+3} ; piercer of ovipositor narrowing sharply between gonopore and apex, spicules on distal end of middle segment of ovipositor with up to 5 large dentations and occasional small dentations (Figs 151, 152) *musae* (some specimens)
 Costal band almost confluent with R_{4+5} and of uniform width; piercer of ovipositor narrowing gradually between gonopore and apex, spicules on distal end of middle segment of ovipositor with 8-12 dentations of approximately equal size (Figs 52, 53) *finitima*
- 9(6). Costal cell fuscous and covered with microtrichia *assita*
 Costal cells pale coloured with microtrichia in outer corner of second cell only 10
- 10(9). Costal cells fulvous; mesopleural stripe reaching anterior npl. bristle; facial spots extremely small and pale *circamusae*
 Costal cells pale fulvous; mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle; facial spots distinct 11
- 11(10). Brown spot on apex of scutellum; costal band narrower than subcostal cell beyond extremity of R_{2+3} ; abdominal terga uniformly orange-brown especially terga III-V *bancroftii*
 Scutellum entirely yellow; costal band at least as wide as subcostal cell beyond extremity of R_{2+3} ; abdominal terga III-V orange-brown with or without small pale fuscous markings 12
- 12(11). Abdominal terga uniformly orange-brown; apex of piercer of ovipositor long and slender (length:width-7:1), spicules at distal end of middle segment of ovipositor at least 4 times wider than long and with 9-12 small dentations of approximately equal size (Figs 46, 47) *contermina*
 Abdominal terga III-V with pale fuscous anterolateral corners on tergum III and a narrow medial longitudinal pale fuscous band over all 3 terga; apex of piercer of ovipositor short and stout (length:width-4.4:1), spicules at distal end of middle segment of ovipositor approximately 2.5 times wider than long and with 1-3 very large dentations (Figs 49, 50) *contigua*

bidentata complex

1. Lateral postsutural vittae broad, parallel sided, ending at upper pa. bristles; hind tibiae fulvous; costal band confluent with R_{2+3} *aeroginosa*
 Lateral postsutural vittae narrow, tapered sharply posteriorly and ending before upper pa. bristles; hind tibiae brown; costal band overlapping R_{2+3} *bidentata*

bryoniae complex

- | | | |
|-------|--|----------------------|
| 1. | Costal band overlapping R ₄₊₅ for entire length | <i>simulata</i> |
| | Costal band confluent with R ₄₊₅ | 2 |
| 2(1). | Abdominal terga II-V with, at most, pale fuscous on anterior and lateral margins of tergum III | <i>paramusae</i> |
| | Abdominal terga mostly black or with distinct dark colour patterns | 3 |
| 3(2). | Abdominal terga mostly black | 4 |
| | Abdominal terga red-brown or orange-brown with dark colour patterns | 6 |
| 4(3). | Wings with microtrichia in outer corner of second costal cell only | <i>epicharis</i> |
| | Wings with microtrichia covering all of both costal cells | 5 |
| 5(4). | Anterodorsal corners of humeral calli pale fuscous; basal band of scutellum narrow; fore tibiae fuscous; 4 sc. bristles present | <i>quadrissetosa</i> |
| | Humeral calli entirely yellow; basal band of scutellum broad; fore tibiae fulvous; 2 sc. bristles present | <i>varipes</i> |
| 6(3). | Lateral postsutural vittae ending at upper pa. bristles; abdominal terga III-V red-brown with a broad dark fuscous band across anterior margin of tergum III and expanding over lateral margins, anterolateral corners of terga IV and V fuscous, a medial longitudinal dark fuscous band over all 3 terga | <i>bryoniae</i> |
| | Lateral postsutural vittae ending before upper pa. bristles; abdominal tergum III black, terga IV and V orange-brown with broad lateral longitudinal bands which are black on tergum IV and dark fuscous on tergum V, a broad medial longitudinal dark fuscous band on terga IV and V joining lateral bands along anterior margin of tergum IV | <i>latissima</i> |

distincta and fulvicauda complexes

- | | | |
|-------|---|--------------------|
| 1. | Humeral and notopleural calli joined by a lateral yellow band | 2 |
| | Humeral and notopleural calli not joined by a lateral yellow band | 3 |
| 2(1). | Mesonotum generally red-brown; abdominal terga mostly orange-brown | <i>morobiensis</i> |
| | Mesonotum black; abdominal terga orange-brown with lateral and medial longitudinal black bands on terga III-V | <i>unifasciata</i> |
| 3(1). | Humeral calli dark fuscous | <i>curreyi</i> |
| | Humeral calli yellow | 4 |
| 4(3). | Notopleural calli dark fuscous to black | 5 |
| | Notopleural calli yellow | 6 |
| 5(4). | Transverse band across wing recurved along CuA ₁ for a short distance; lateral postsutural vittae ending at upper pa. bristles; abdomen with a broad medial and 2 broad lateral longitudinal black bands on terga II-V | <i>ampla</i> |
| | Transverse band across wing not recurved along CuA ₁ ; lateral postsutural vittae ending before upper pa. bristles; abdomen with a broad medial longitudinal black band on terga II-V and 2 broad lateral longitudinal black bands on terga III-V | <i>decumana</i> |
| 6(4). | Mesopleural stripe reaching humeral callus | <i>fulvicauda</i> |
| | Mesopleural stripe not reaching humeral callus | 7 |
| 7(6). | Transverse fuscous band across wing broad, maximum width equal to or greater than 1/3 length of discoidal cell | 8 |
| | Transverse fuscous band narrower than above | 9 |
| 8(7). | Costal cells pale fuscous with microtrichia in outer corner of second costal cell only; lateral postsutural vittae broad and ending at upper pa. bristles; mesopleural stripe ending midway between anterior margin of notopleural callus and anterior npl. bristle | <i>unistriata</i> |
| | Costal cells fuscous and covered by dense microtrichia; lateral postsutural vittae narrow and ending before upper pa. bristles; mesopleural stripe equal in width to notopleural callus | <i>pulchra</i> |
| 9(7). | Lateral postsutural vittae ending before upper pa. bristles | 10 |
| | Lateral postsutural vittae ending at upper pa. bristles | 12 |

- 10(9). Scutellum yellow without a dark apical spot; transverse band across wing straight and of medium width (covering almost $\frac{1}{3}$ of discoidal cell) *atriliellata*
 Scutellum yellow with a fuscous apical spot; transverse band across wing curved and narrower than above 11
- 11(10). Costal cells fulvous, microtrichia in outer corner of second costal cell only; costal band paler towards centre of wing; legs fulvous except apical 4 segments of all tarsi fuscous and hind tibiae dark fulvous; abdominal terga fulvous with a broad medial and 2 irregularly shaped lateral longitudinal glossy black bands on terga III-V *anomala*
 Costal cells dark fuscous, microtrichia in all of second costal cell; costal band entirely dark fuscous; legs fulvous except apex of hind tibiae and apical 4 segments of all tarsi fuscous; abdominal terga II-V orange-brown with a broad transverse black band on base of tergum II, a broad medial and 2 broad lateral longitudinal black bands running from transverse band on tergum II to apex of abdomen *distincta*
- 12(9). Costal band overlapping R_{2+3} but not confluent with R_{4+5} 13
 Costal band confluent with R_{4+5} 15
- 13(12). Costal cells pale fuscous; transverse band across wing narrow and covering outer corner of discoidal cell only; abdominal terga II-V orange-brown with a broad medial longitudinal dark band on all 4 terga and 2 lateral longitudinal dark bands of medium width on terga III-V *furvilineata*
 Costal cells fulvous; transverse band across wing covering almost apical $\frac{1}{3}$ of discoidal cell; abdominal terga mostly orange-brown with, at most, small irregular fuscous markings or red-brown with broad medial and lateral longitudinal dark bands on terga III-V 14
- 14(13). Abdominal terga III-V red-brown with a broad medial longitudinal dark fuscous to black band and 2 broad lateral longitudinal dark fuscous bands which join along anterior margin of tergum III *latilineata*
 Abdominal terga mostly orange-brown occasionally with a narrow fuscous band on terga III-V or IV and V and a small fuscous spot on anterolateral corners of tergum III *rhabdota*
- 15(12). Costal cells colourless; abdominal terga black except orange-brown posterocentrally on terga IV and V *oblineata*
 Costal cells coloured; abdominal terga either uniformly orange-brown or orange-brown with longitudinal dark bands 16
- 16(15). Abdominal terga uniformly orange-brown with, at most, a very pale fuscous narrow medial longitudinal band on terga III and IV *propedistincta*
 Abdominal terga orange-brown with a distinct pattern of longitudinal dark bands ... 17
- 17(16). Costal cells fuscous; microtrichia covering all of second and most of first costal cell; abdominal terga with broad lateral longitudinal dark bands on terga I-V *fergussoniensis*
 First costal cell fulvous, second costal cell fuscous; microtrichia covering outer $\frac{1}{2}$ of second costal cell only; abdominal terga with broad lateral longitudinal dark bands on terga III-V *pseudodistincta*

fagraea complex

1. Abdomen with a well defined medial black band on terga III-V *rufescens*
 Abdomen without a medial black band 2
- 2(1). Abdominal terga III and IV with lateral fuscous markings 3
 Abdominal terga III and IV uniformly coloured, without fuscous markings 4
- 3(2). Mesonotum and abdomen uniformly red-brown; rarely with narrow longitudinal fuscous bands on mesonotum; fuscous areas on extreme lateral margins of abdominal terga III and IV only; mesopleural stripe not wider than notopleural callus; lateral postsutural vittae not broad and narrowing posteriorly *halfordiae*
 Mesonotum red-brown with or without a pattern of fuscous markings; abdomen usually fuscous over most of terga III and IV and laterally on tergum V; mesopleural stripe 1.5 times width of notopleural callus; lateral postsutural vittae parallel sided for most of

- its length *kraussi*
 4(2). Abdominal tergum V with a pair of dark shining spots; mesonotum red-brown; basal band of scutellum approximately $\frac{1}{2}$ length of scutellum *russeola*
 Abdominal tergum V without dark shining spots; mesonotum orange-brown; basal band of scutellum approximately $\frac{1}{3}$ length of scutellum *fagraea*

frauenfeldi complex

1. Humeral calli yellow with anterolateral corners black; width of black basal band on scutellum approximately $\frac{1}{3}$ the scutellum length *caledoniensis*
 Humeral calli entirely black; scutellum with dorsal black marking generally extending to apex 2
 2(1). Lateral postsutural vittae present; black marking on dorsal surface of scutellum triangular and when reaching apex it ends in a point between apical bristles *frauenfeldi*
 Lateral postsutural vittae absent; black marking on dorsal surface of scutellum broader and enclosing the apical bristles 3
 3(2). Face fulvous with medium sized oval black spots; costal cells pale fuscous; microtrichia covering most of second costal cell; costal band absent beyond subcostal cell; legs fulvous except apical $\frac{2}{3}$ to $\frac{3}{4}$ of mid femora and apical $\frac{1}{2}$ hind femora black, fore and mid tibiae fuscous and hind tibiae dark fuscous *parafrauenfeldi*
 Face glossy black; costal cells extremely pale fuscous; microtrichia on outer $\frac{1}{2}$ of second costal cell only; costal band present but pale beyond subcostal cell; legs fulvous except apical $\frac{1}{3}$ hind femora and hind tibiae fuscous *trilineola*

furfurosa and notatagena complexes

1. Costal cells colourless or with a very pale tint *furfurosa*
 Costal cells coloured 2
 2(1). Costal cells pale fulvous or pale fuscous with microtrichia covering all or part of second costal cell 3
 Costal cells fuscous with dense microtrichia covering both cells 4
 3(2). Costal cells pale fulvous with microtrichia covering all of second cell; humeral calli entirely yellow; mesonotum uniformly fuscous; legs fulvous except hind tibiae pale fuscous *popondettiensis*
 Costal cells pale fuscous with microtrichia on outer $\frac{1}{2}$ of second cell only; humeral calli yellow except anterior $\frac{1}{3}$ fuscous; mesonotum dark fuscous with paler markings; legs fulvous except apices of fore and hind femora red-brown to pale fuscous and fore and hind tibiae fuscous tending darker basally *obfuscata*
 4(2). Humeral calli yellow except anterior $\frac{1}{3}$ fuscous *romigae*
 Humeral calli entirely yellow 5
 5(4). Lateral postsutural vittae ending at upper pa. bristles; abdominal terga mostly black; legs with femora generally dark fuscous, tibiae pale fuscous except mid tibiae fulvous ...
 *nigrovittata*
 Lateral postsutural vittae ending before upper pa. bristles; abdominal terga and legs not entirely dark coloured 6
 6(5). Mesonotum red-brown with a dark fuscous lanceolate pattern; abdominal terga III-V with broad lateral longitudinal dark fuscous bands; legs fulvous except fore and mid femora and hind tibiae fuscous *notatagena*
 Mesonotum pale fuscous with 2 lateral longitudinal dark fuscous to black bands; abdominal terga III-V with an indistinct narrow medial longitudinal pale fuscous band and broad lateral longitudinal dark fuscous to black bands; legs fulvous except fore tibiae pale fuscous and hind tibiae fuscous *ustulata*

mayi complex

1. Anal streak narrow, approximating width of anal cell (or much paler if extending towards base of discoidal cell) with microtrichia never extending over the entire coloured streak

(see Fig. 15, Drew et al. 1981); mesonotum pale red-brown; abdomen pale orange-brown

..... *pallida*
Anal streak broad, reaching almost to base of discoidal cell and covered with microtrichia
for entire width (see Fig. 15, Drew et al. 1981); mesonotum and abdomen red-brown or
dark red-brown 2

2(1). Lateral postsutural vittae broad, almost parallel sided for part of length; mesonotum and
abdomen red-brown; mesonotum seldom marked with fuscous and then only laterally
before mesonotal suture and along inner margins of lateral postsutural vittae *tenuifascia*

Lateral postsutural vittae not broad, narrowing sharply posteriorly; mesonotum and abdomen
dark red-brown; mesonotum usually with a pair of longitudinal parallel black bands
centrally *mayi*

quadrata complex

1. Abdominal terga III-V with a more or less distinct medial fuscous band 2

Abdominal terga IV and V only with a distinct medial fuscous band 4

2(1). Abdominal terga III-V with broad lateral fuscous patches; medial band well defined
..... *antigone*

Abdominal tergum III with broad lateral fuscous patches, terga IV and V with patches narrow
or absent; medial band not well defined 3

3(2). Lateral postsutural vittae broad, parallel sided; costal band of wing barely overlaps vein
R₂₊₃; hind tibiae fulvous *peninsularis* (some specimens)

Lateral postsutural vittae tapered posteriorly; costal band of wing almost reaches vein R₄₊₅;
hind tibiae fuscous on basal $\frac{2}{3}$ *erubescens*

4(1). Mesonotum orange-brown; abdominal terga III-V with a very narrow lateral fuscous margin;
hind tibiae fulvous; femora fulvous *aurantiaca*

Mesonotum red-brown; abdominal tergum III with lateral fuscous patches, remaining terga
dark fulvous; hind tibiae fuscous; femora fuscous at apex *quadrata*

recurrens complex

1. A U-shaped coloured band across wing between costal band and hind margin 2

A S- or Z-shaped coloured band across wing between costal band and hind margin .. 3

2(1). Abdominal terga III-V orange-brown with narrow pale fuscous lateral margins
..... *absidata*

Abdominal terga mostly orange-brown with a medial longitudinal fuscous band on terga
I-V and lateral margins of tergum III brown *resima*

3(1). Coloured band across wing S-shaped 4

Coloured band across wing Z-shaped 5

4(3). Mesonotum red-brown with diffuse black markings; lateral postsutural vittae broad and
reaching upper pa. bristles; abdominal terga III-V with a narrow medial longitudinal pale
fuscous band and pale fuscous on lateral margins of tergum III *recurrens*

Mesonotum red-brown with a lanceolate fuscous pattern; lateral postsutural vittae narrow
and ending before upper pa. bristles; abdominal terga III-V orange-brown with broad
medial and lateral longitudinal bands joined along anterior margin of tergum III ...
..... *manskii*

5(3). Lateral postsutural vittae short, tapering and ending well before upper pa. bristles; wing
markings fuscous to dark fuscous; abdominal terga III-V with a broad medial and 2 broad
lateral longitudinal black bands joined along anterior margin of tergum III
..... *nigrescens*

Lateral postsutural vittae broad, parallel sided and reaching to or behind upper pa. bristles;
wing markings pale fuscous; abdominal terga III-V with medial and lateral longitudinal
dark bands not joined on tergum III 6

6(5). Abdominal terga mostly orange-brown with a narrow medial longitudinal fuscous band on
terga II-V and anterolateral corners of tergum II fuscous (in some specimens, the medial

- band is wider and the lateral margins of terga III-V are infuscated) *anfracta*
 Abdominal terga orange-brown with 2 broad lateral longitudinal black bands on terga III-V
 and a broad medial longitudinal black band on terga II-V *redunca*

silvicola complex

1. Costal cells fulvous 2
 Costal cells colourless or with a very pale tint 4
- 2(1). Lateral postsutural vittae broad and ending at upper pa. bristles; mesonotum with broad
 lateral longitudinal black bands *turneri*
 Lateral postsutural vittae narrowing posteriorly and ending before or just reaching upper
 pa. bristles; mesonotum with small fuscous patterns 3
- 3(2). Mesopleural stripe ending midway between anterior margin of notopleural callus and anterior
 npl. bristle; fulvous tint across wing (in some specimens); scutellum with a broad red-
 brown basal band (in some specimens) *abundans*
 Mesopleural stripe reaching anterior npl. bristle; no coloured tint across wing; scutellum
 always with a narrow dark basal band *abscondita*
- 4(1). Lateral postsutural vittae ending before upper pa. bristles *silvicola*
 Lateral postsutural vittae ending at or behind upper pa. bristles 5
- 5(4). Costal band confluent with R₂₊₃; abdominal terga III-V with an indistinct narrow medial
 longitudinal fuscous band and 2 lateral longitudinal fuscous bands not joined on tergum
 III *breviaculeus*
 Costal band overlapping R₂₊₃; abdominal terga III-V with a medial and 2 lateral
 longitudinal fuscous bands joined along anterior margin of tergum III 6
- 6(5). Mesonotum uniformly red-brown without dark markings; legs with hind tibiae and apices
 of all femora fuscous *quasisilvicola*
 Mesonotum with variable dark markings; legs with femora entirely fulvous 7
- 7(6). Face with a pair of large oval black spots; mesonotum dark red-brown with fuscous lateral
 longitudinal bands; abdominal terga without a dense golden pubescence *rufofuscula*
 Face with a pair of very small pale spots; mesonotum with a broad medial longitudinal fuscous
 area surrounded laterally and posteriorly by irregular dark fuscous to black patterns;
 abdominal terga covered by a dense golden pubescence *cinnamea*

tryoni complex

1. Humeral calli brown or dark brown *neohumeralis*
 Humeral calli yellow 2
- 2(1). Mesonotum and abdominal terga fuscous with a pattern of dark fuscous to black markings;
 apical ½ of mid and hind femora fuscous *melas*
 Mesonotum and abdominal terga generally red-brown or fulvous, often with fuscous
 markings; legs either entirely fulvous or fore and hind tibiae and apices of fore and hind
 femora infuscated 3
- 3(2). Mesonotum pale red-brown and abdominal terga fulvous without distinct fuscous markings;
 piercer of ovipositor needle shaped and pointed at apex (Fig. 186) *aquilonis*
 Mesonotum and abdominal terga red-brown with distinct fuscous markings; piercer of
 ovipositor needle shaped and rounded at apex (Fig. 195) *tryoni*

Genus **Dacus** FabriciusSubgenus **Callantra** Walker**Dacus (Callantra) axanus**
(Hering), n. comb. (Figs 405–407)*Callantra (Mellesis) axana* Hering, 1938: 410.*Callantra axana*: Hardy and Adachi, 1954: 149; Drew, 1973: 2.*Callantra auricoma* May, 1955: 153–5 (new syn.).*Callantra smieroides*: Drew, 1972a: 10; 1972b: 189; 1973: 2–6; Drew et al. 1981: 85 (misidentification).

MATERIAL EXAMINED

Holotype ♂ of *C. auricoma*; a large series of specimens in DPI (see DISTRIBUTION). Also, the following specimens in BMNH: holotype ♂ of *C. axana* (abdomen and 1 wing missing), Kei I., with a label "Purch. from E.M. Hering, B.M. 1965–270"; 1 ♂, N. Guinea Mer., Kapakapa, Mag. Giugno. 1891, L. Loria det. *Callantra axana* Hering by Hering in 1941, with a label "Purch. from E.M. Hering, B.M. 1965–270"; 1 ♀, Kei I., V. Roder, with a label "Purch. from E.M. Hering, B.M. 1965–270".

LOCATION OF TYPES: *C. axana*, holotype in BMNH; *C. auricoma*, holotype (T.5309) in QM.

DISTRIBUTION

Widespread and abundant in the northeastern and northwestern zones of Australia, Torres Strait islands, Papua New Guinea, New Britain, New Ireland, Lihir I. and Kei I. (type locality).

DIAGNOSIS

Large species; face dark fulvous with a pair of large irregularly oval spots; humeral calli yellow to yellow-brown; notopleural calli yellow; mesonotum red-brown with irregular fuscous patterns, lateral and medial postsutural vittae absent, mesopleural stripe of varying width (equal to width of notopleural callus or extending midway between anterior margin of notopleural callus and anterior npl. bristle), yellow triangle extending along anterior margin of mesonotal suture, scutellum yellow or fulvous with a broad red-brown basal band or entirely red-brown; bristles: sc. 2, prsc. absent, sa. 1; wing with a very broad fuscous costal band overlapping R_{4+5} and broad fulvous anal streak, costal cells orange-brown with dense microtrichia covering both cells; abdominal tergum III fuscous, terga IV and V fuscous with an oval orange-brown spot medially across intersegmental suture and connected to posterior margin of tergum V by a narrow medial longitudinal orange-brown band; all abdominal terga covered with a dense golden pubescence.

DESCRIPTION

FEMALE: Ovipositor basal segment red-brown, cylindrical and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.29:1. Apex of piercer needle shaped with 3 pairs of short subapical bristles (Fig. 406). Spicules at distal end of middle segment consisting almost entirely of flat triangular dentations which vary markedly in size (Fig. 407).

ATTRACTANT: Cue lure.

COMMENTS

Previously, the status of *D. axanus* could not be determined, as the single specimen from which it was described could not be located but Drew (1973) suggested that it may be a synonym of *D. smieroides* (Walker). Since then the holotype and 2 specimens identified by Hering have been found and *D. axanus* can now be defined. It is clear that the description of *Callantra smieroides* Walker by Drew (1973) is in fact of *D. axanus* and adequately defines this species. *D. smieroides* is restricted to Celebes, Brunei and what was formerly Borneo, while *D. axanus* is more eastern. *D. axanus* is similar to *D. capillaris* (Drew) in having a red-brown mesonotum and costal band overlapping R_{4+5} and in lacking postsutural vittae, spines on the ventral surfaces of fore femora and black spots on the eye margins. It differs from this species in having a pattern of large longitudinal fuscous bands on the mesonotum, costal band fuscous and abdominal terga III–V fuscous with orange-brown patterns.

Dacus (Callantra) capillaris
(Drew), n. comb. (Fig. 408)

Callantra capillaris Drew, 1972b: 185–7.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6982) in QM.

DISTRIBUTION

Known only from Bougainville I. (type locality, Kieta).

DIAGNOSIS

Large species; face with large pear shaped black spots; humeral calli generally red-brown to brown; notopleural calli yellow; mesonotum red-brown with irregular fuscous markings, lateral and medial postsutural vittae absent, mesopleural stripe of medium width (extending midway between anterior margin of notopleural callus and anterior npl.

bristle), yellow triangle extending along anterior margin of mesonotal suture, scutellum generally red-brown to dark red-brown; bristles: sc. 2, prsc. absent, sa. 1 present in $\frac{2}{3}$ of specimens (absent in remaining $\frac{1}{3}$); wing with a broad fulvous costal band overlapping R_{4+5} and anal streak, costal cells fulvous with dense microtrichia covering both cells; abdominal terga II–V uniformly orange-brown without dark markings, posterior lobe of surstylus short, abdominal sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

This species was described adequately by Drew (1972b) and it is similar to *D. smieroides* (Walker).

***Dacus (Callantra) discors*, n. sp.** (Fig. 409)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, attracted to cue lure, 11.iv.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: Upper Manki logging area, Bulolo, 2 ♂♂, 25.iii.1980, 2 ♂♂, 1.iv.1980, 2 ♂♂, 8.iv.1980, 1 ♂, 11.iv.1980, P. Daur; 2 ♂♂, Kunai Creek (1450 m) and 1 ♂, Pitpit Gully (1550 m), Mt Kaindi, 29.xii.1980, A. Allison. All attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10452) and 1 paratype (T.10453) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 6 paratypes in DPI.

DISTRIBUTION

Known only from the Bulolo–Wau area, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with a small fulvous area surrounded by dark fuscous to black; humeral calli entirely dark fuscous or with a central yellow spot surrounded by dark fuscous; notopleural calli yellow; mesonotum fuscous to brown with large black markings, lateral postsutural vittae absent, medial postsutural vitta present, mesopleural stripe very narrow (equal in width to notopleural callus), yellow triangle extending from notopleural callus along anterior margin of mesonotal suture, scutellum yellow with a broad fuscous to brown basal band; wing with a broad fuscous costal band and anal streak, costal cells fuscous and covered with microtrichia; abdominal terga III–V black with transverse orange-brown bands along posterior margins of terga IV and V.

DESCRIPTION

MALE: Head generally fuscous. Vertical length 1.68 mm. Frons narrowing slightly posteriorly, length 1.17 times breadth; fuscous with black spots around orbital bristles and fulvous ventrally and irregular fulvous markings laterally; anteromedial hump covered with short dark setae, orbital bristles black: 1 s.or., 2 i.or. (i.or. not well developed); lunule dark fuscous. Ocellar triangle black. Vertex fuscous. Face fulvous in centre, surrounded dorsally and ventrally with dark fuscous and laterally with large elongate, black facial spots which cover antennal furrows; length of face 0.58 mm. Genae dark fuscous, large black subocular spot present; black bristle present. Occiput fuscous to black, yellow along eye margins; occipital row with a large number of well developed black bristles. Antennae with segments 1 and 2 fuscous, segment 3 dark fuscous; without dorsal bristle on segment 2; arista dark fuscous (fulvous basally); length of segments: 0.41 mm; 0.50 mm; 1.19 mm.

Thorax mesonotum black with an irregular brown area posteriorly which also extends along lateral margins and around medial postsutural vitta. Pleural areas black with small areas of dark fuscous below humeral calli and above mid coxae. Yellow markings as follows: notopleural calli; a triangle extending along anterior margin of mesonotal suture from notopleural callus; narrow mesopleural stripe equal in width to notopleural callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (anterior and posterior apices dark fuscous); a dorsocentral spot on lower hypopleural calli (remainder dark fuscous); a narrow medial longitudinal vitta from level of upper pa. bristles and narrowing anteriorly to level of mesonotal suture. Humeral calli entirely dark fuscous in 4 specimens and with a central yellow spot surrounded by dark fuscous in remaining specimens. Lateral postsutural vittae absent. Postnotum black laterally, dark fuscous centrally. Scutellum yellow with a broad fuscous to brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 2 outer (reduced inner scp. sometimes present); all bristles well developed and black.

Legs fore and mid coxae dark fuscous, hind coxae black; fore femora black on outer and dark fuscous on inner lateral surface, mid femora black except for a dark fuscous band dorsally, hind femora black; all tibiae fuscous to dark fuscous; tarsi fulvous; fore femora with rows of long pale setae on dorsal surface; mid tibiae each with an apical black spur.

setae on dorsal surface; mid tibiae each with an apical black spur.

Wings length 6.9 mm; costal cells dark fuscous, dense microtrichia covering both costal cells; subcostal cell dark fuscous, broad dark fuscous costal band confluent with M, narrow fuscous anal streak ending at wing margin, remainder of wings with a pale fuscous tint; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate, terga fused but overlapping laterally except between terga I and II; pecten present on tergum III; tergum I long and narrow; sterna I and II longer than wide. Terga black except for narrow transverse orange-brown bands across posterior margins of all terga (except III), the transverse band on tergum IV does not extend to the lateral margins. A pair of oval shining spots on tergum V. Posterior lobe of surstylus of medium length, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. discors is similar to *D. mayi* in possessing a broad dark fuscous to black triangle on the dorsal surface of the scutellum, but differs from this species in possessing a medial postsutural yellow vitta on the mesonotum.

Dacus (Callantra) impar, n. sp. (Figs 410–412)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Susu, Bulolo, 5.v.1980, P. Daur.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 3 ♂♂, Mt Susu, Bulolo, 24.iv.1980, P. Daur; 1 ♂, Morobe District, August 1971, J. Maiyel; 1 ♂, Gabensis (on Lae–Bulolo road), 18–22.vi.1980, R.A.I. Drew and D.W.Currey; 1 ♀ (at M.V. light), Stony logging area, Bulolo, 18.iv.1979, H. Roberts; 2 ♂♂, Mt Misim (1100 m), 18.xii.1980 and 4.vi.1981, A. Allison. Western Highlands District: 1 ♂, H.A.T.I., Mt Hagen, 18.xi.1980, B. Thistleton. LOCATION OF TYPES: Holotype (T.10454) and 1 paratype (T.10455) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 5 paratypes in DPI.

DISTRIBUTION

Known only from the Bulolo–Wau area and Mt Hagen, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with a pair of large black spots; humeral calli yellow (fuscous on anterior margins); notopleural calli yellow; mesonotum black, lateral and medial postsutural

vittae absent, mesopleural stripe of medium width (extending almost to anterior npl. bristle), yellow triangle extending from notopleural callus along anterior margin of mesonotal suture, scutellum yellow with a broad dark basal band; wing with a broad dark fuscous costal band, anal streak absent, costal cells fuscous with microtrichia covering second costal cell and outer $\frac{1}{2}$ of first cell; abdominal tergum III black, terga IV–V orange-brown with 2 broad lateral and 1 broad medial longitudinal black bands.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.1 mm. Frons narrowing slightly posteriorly, length 1.6 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered with short dark setae; orbital bristles black: 1 s.or., 2 i.or. (some specimens have a pair of reduced i.or. bristles between the 2 larger i.or.); lunule dark fulvous, large and smooth in texture. Ocellar triangle black. Vertex fuscous. Face dark fulvous with a pair of large, irregularly oval, black facial spots; length of face 0.35 mm. Genae dark fulvous, large dark fuscous subocular spot present; black bristle present. Occiput dark fuscous, yellow along eye margins; occipital row with a large number of small dark bristles. Antennae with segment 1 fuscous, segments 2 and 3 dark fuscous; a pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.37 mm; 0.40 mm; 0.78 mm.

Thorax mesonotum black. Pleural areas black with small areas of dark fuscous below humeral calli and above mid coxae. Yellow markings as follows: humeral calli (except fuscous on anterior margins); notopleural calli; a triangle extending along anterior margin of mesonotal suture from notopleural callus; mesopleural stripe of medium width, extending almost to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (posterior $\frac{1}{3}$ and ventral margins black); lateral and medial postsutural vittae absent. Postnotum black. Scutellum yellow with a narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs coxae dark fuscous; fore femora fuscous, mid femora dark fuscous to black, hind femora fulvous with apical $\frac{1}{3}$ dark fuscous; fore tibiae fuscous, mid and hind tibiae dark fuscous; tarsi fulvous; fore femora with a few long black setae

on dorsal surface; mid tibiae each with an apical black spur.

Wings length 4.6 mm; costal cells fuscous, microtrichia covering all of second and outer $\frac{1}{2}$ of first costal cells; remainder of wings colourless except for dark fuscous subcostal cell, broad dark fuscous costal band confluent with R_{4+5} and ending just beyond extremity of R_{4+5} ; anal streak absent; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate, terga fused; pecten present on tergum III; tergum I long and narrow; sterna I and II longer than wide. Tergum I black except for a narrow transverse orange-brown band across posterior margin; tergum II black except for orange-brown transverse spots on posterior margin each side of the medial longitudinal black band; tergum III black, terga IV–V orange-brown except for 2 broad lateral longitudinal black bands meeting along anterior margin of tergum IV and ending at posterior margin of tergum V and a broad medial longitudinal black vitta narrowing to end just before posterior margin of tergum V. A pair of oval shining spots on tergum V. Posterior lobe of surstylus 6 times length of anterior lobe, sternum V with posterior margin straight.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, dorsoventrally flattened and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.38:1. Apex of piercer needle shaped with 4 pairs of very short subapical bristles (Fig. 411). Spicules at distal end of middle segment with a small number of very large thick dentations, 1 always much larger (Fig. 412).

ATTRACTANT: No known record.

COMMENTS

D. impar is similar to *D. melanohumeralis* in possessing a black mesonotum and a scutellum of uniformly pale colouration but differs from this species in having the humeral calli mostly yellow and hind femora fulvous with apical $\frac{1}{3}$ dark fuscous.

***Dacus (Callantra) mayi* (Drew), n. comb. (Fig. 413)**

Not *Dacus mayi* Hardy, 1951: 161–2.
Callantra mayi Drew, 1972b: 187–8.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.6984) in QM.

DISTRIBUTION

Known only from Morobe Province (type locality, Wau), Papua New Guinea.

DIAGNOSIS

Large species; face with medium sized oval black spots; humeral calli brown; notopleural calli yellow; mesonotum dull black, lateral and medial postsutural vittae absent, mesopleural stripe narrow, equal in width to notopleural callus, yellow triangle extending along anterior margin of mesonotal suture, scutellum yellow with a broad dark fuscous triangle on dorsal surface; bristles: sc. 2, prsc. absent, sa. 1; wing with a broad fuscous costal band and broad fulvous anal streak, costal cells fulvous with dense microtrichia covering both cells; abdominal terga III–V dull black except for a dark red-brown band along posterior margin of tergum V and a medial longitudinal red-brown band on tergum V, posterior lobe of surstylus short, abdominal sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. mayi was described adequately by Drew (1972b). It is similar to *D. discors* but differs from this species in lacking a medial postsutural vitta on the mesonotum. Although the name *mayi* has been used in *Dacus* by Hardy (1951) no replacement name is required for *D. mayi* (Drew), according to Article 59c of the International Code of Zoological Nomenclature, as these two taxa are not considered congeneric.

***Dacus (Callantra) melanohumeralis*, n. sp. (Fig. 414)**

TYPE SPECIMEN

Holotype ♂, PAPUA NEW GUINEA, Central District: Hombrom Bluff, attracted to methyl eugenol, 16–24.xi.1973, Entomology Staff.

LOCATION OF TYPE: Holotype (T.10456) in QM.

DISTRIBUTION

Known only from Hombrom Bluff, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with a pair of large black spots; humeral calli fuscous; notopleural calli

yellow; mesonotum black, lateral and medial postsutural vittae absent, mesopleural stripe narrow, just wider than notopleural callus, yellow triangle extending from notopleural callus along anterior margin of mesonotal suture, scutellum yellow with a narrow dark basal band; wing with a broad dark fuscous costal band, anal streak absent, costal cells fuscous with microtrichia covering second costal cell and outer $\frac{1}{2}$ of first costal cell; abdominal terga III–V orange-brown with 2 broad lateral and 1 broad medial longitudinal black bands.

DESCRIPTION

MALE: Head generally dark fulvous. Vertical length 1.58 mm. Frons narrowing slightly posteriorly, length 1.63 times breadth; dark fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered with short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous, large and smooth in texture. Ocellar triangle black. Vertex fuscous. Face dark fulvous to fuscous with a pair of large irregularly oval, black facial spots; length of face 0.45 mm. Genae fuscous, black subocular spot present; black bristle present. Occiput fuscous laterally, dark fulvous centrally, fulvous along eye margins; occipital row with 5–7 large dark bristles. Antennae with segments 1 and 2 fuscous, segment 3 missing; a pale dorsal bristle on segment 2; length of segments: 0.46 mm; 0.51 mm.

Thorax mesonotum black. Pleural areas black except dark fuscous below humeral calli and above mid coxae. Yellow markings as follows: notopleural calli; a triangle extending along anterior margin of mesonotal suture from notopleural callus; narrow mesopleural stripe just wider than notopleural callus dorsally, anterior margin straight; upper hypopleural calli (posterior apices black); anterodorsal spot on lower hypopleural calli (remainder black). Lateral and medial postsutural vittae absent. Humeral calli fuscous. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 5; all bristles well developed and black.

Legs all coxae and fore and hind femora fuscous to dark fuscous; mid femora dark fuscous; fore tibiae fuscous, mid and hind tibiae fuscous to dark fuscous; tarsi fulvous; mid tibiae each with an apical black spur; fore femora with a row of long dark setae on dorsal surface.

Wings length 6.0 mm; costal cells fuscous, microtrichia covering second and outer $\frac{1}{2}$ of first costal cells; remainder of wing colourless except

for a dark fuscous subcostal cell, broad dark fuscous costal band confluent with R_{4+5} and ending between extremities of R_{4+5} and M; anal streak absent; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate; terga fused; pecten present on tergum III; tergum I long and narrow; sterna I and II longer than wide. Tergum I black except for a narrow transverse orange-brown band across posterior margin; tergum II black except for large transverse orange-brown spots on posterior margin each side of a medial longitudinal black band; terga III–V orange-brown except for 2 broad lateral longitudinal black bands which join along anterior margin of tergum III and run over all 3 terga and a broad medial longitudinal black band running from tergum III to end just before posterior margin of tergum V. A pair of oval shining spots on tergum V. Posterior lobe of surstylus of medium length, sternum V with posterior margin straight.

ATTRACTANT: Methyl eugenol.

COMMENTS

D. melanohumeralis is similar to *D. impar* in having a black mesonotum and a scutellum of uniformly pale colouration but differs from this species in possessing fuscous humeral calli and hind femora fuscous to dark fuscous.

Dacus (Callantra) petioliforma

(May), n. comb. (Figs 415–418)

Callantra petioliforma May, 1955: 151–3; May, 1962a: 63.

MATERIAL EXAMINED

Holotype ♂, Rockhampton, Queensland, iv.1955, T. Passlow; 1 ♂ paratype in DPI, Ayr, north Queensland, 30.viii.1955, A.W.S. May; 1 ♀ in QM labelled "allotype, Lawes, v.1955".

LOCATION OF TYPE: Holotype (T.5308) in QM.

DISTRIBUTION

Known from coastal areas of Queensland, north of Rockhampton; type locality, Rockhampton.

DIAGNOSIS

Large species; face with small elongate black spots connected by a transverse black band across ventral margin; humeral and notopleural calli yellow; mesonotum fuscous with longitudinal dark fuscous bands, lateral and medial postsutural vittae absent, mesopleural stripe narrow, slightly wider than notopleural callus, a small oval yellowish spot in centre of mesonotum, yellow triangle extending from notopleural callus along anterior margin of

mesonotal suture, scutellum yellow; wing with a broad fuscous costal band and narrow fuscous anal streak, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III–V dark fuscous except for 2 orange-brown spots on posterior margins of terga IV and V either side of a medial longitudinal dark fuscous to black band.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 2.2 mm. Frons narrowing slightly posteriorly, length 1.17 times breadth; fulvous with fuscous on anteromedial hump, latter covered by a small number of short dark setae; 2 large black spots on the lateroventral margins of the frons, lateral to the antennae; orbital bristles red-brown: 1 s.or.; i.or. absent; lunule fulvous. Ocellar triangle black. Vertex with black spots either side of ocellar triangle. Face fulvous with small elongate black spots connected by a narrow transverse black band across ventral margin; length of face 0.68 mm. Genae fulvous, dark fuscous subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with a large number of short pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 pale fuscous; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.50 mm; 0.60 mm; 1.28 mm.

Thorax mesonotum fuscous except for a medial longitudinal dark fuscous band which is broader at the posterior margin and 2 very narrow lateral longitudinal dark fuscous bands. Pleural areas dark fuscous except red-brown above mid coxae and below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; narrow mesopleural stripe, slightly wider than notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; anterior corner of upper hypopleural calli (remainder dark fuscous); anterior $\frac{3}{4}$ lower hypopleural calli (remainder dark fuscous); a small oval yellowish spot in mid-line of mesonotum, slightly posterior of the centre point; yellow triangle extending from notopleural callus along anterior margin of mesonotal suture. Lateral postsutural vittae absent. Postnotum dark fuscous. Scutellum yellow except for narrow fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. a variable number of small bristles; bristles generally well developed and black except sa. and upper pa. weak.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; femora entirely fuscous; tibiae pale fuscous; all tarsal segments fulvous; mid tibiae each with an apical black spur; 2–3 strong black

spines on anteroventral surface of fore femora.

Wings length 8.7 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings with a pale fuscous tint except fuscous subcostal cell, broad fuscous costal band confluent with M except beyond r–m crossvein; no dark coloured anal streak; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate; terga fused; pecten present on tergum III. Tergum I and sterna I and II longer than wide. Tergum I orange-brown; tergum II dark fuscous except for a narrow transverse fulvous band across posterior margin but not reaching lateral margins; tergum III dark fuscous; terga IV and V dark fuscous except for 2 orange-brown spots on posterior margins either side of a medial longitudinal dark fuscous to black band. A pair of oval dark fuscous shining spots on tergum V. Posterior lobe of surstylus short, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, cylindrical and tapering posteriorly in dorsal view. Ratio of length of oviscape to length of tergum V 0.71:1. Apex of piercer laterally compressed with several keels and very short subapical bristles (Figs 416, 417). Spicules at distal end of middle segment flat with 7–9 irregularly sized broad dentations (Fig. 418).

ATTRACTANT: No known record.

COMMENTS

D. petioliforma is similar to *D. capillaris* (Drew) and *D. smieroides* (Walker) in having the costal band overlapping R_{4+5} and the mesonotum basically red-brown or fuscous with fuscous to dark fuscous patterns. It differs from these 2 species in having a row of 3–4 black spines on the ventral surface of the fore femora and black spots on the eye margins level with the base of each antenna. In the description above, the following characters differ from May (1955) (original characters in brackets): humeral calli yellow (humeral calli pale brown); scutellum yellow with narrow fuscous basal band (scutellum yellow with a semicircular brown area covering basal $\frac{1}{2}$); costal band confluent with M from base of wing to r–m crossvein (costal band not confluent with M). Originally May (1955) designated only the male holotype and one male paratype. A female (in QM) designated allotype by May (1962a) is not a type

as it was not in the original series. May (1955) stated that the paratype in DPI was collected by G.W. Saunders, but the label reads A.W.S. May.

Dacus (Callantra) pusillus
(May), n. comb. (Fig. 419)

Callantra pusilla May, 1965: 58–61.

Not *Dacus pusillus* Hardy, 1983: 18–20.

MATERIAL EXAMINED

Holotype ♂; 6 ♂ paratypes in DPI, Kuranda, north Queensland, Feb., Apr., May 1964, R. Grattidge; a series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype (T.6307) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: North Queensland (type locality, Kuranda).

NEW RECORDS: Torres Strait islands: Thursday, Yam (records from Plant Quarantine Survey).

DIAGNOSIS

Small species; large oval black facial spots present; humeral calli brown; notopleural calli yellow; mesonotum red-brown to fuscous with irregularly shaped lateral longitudinal black bands, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral and medial postsutural vittae absent; scutellum yellow to red-brown; wing with a broad fuscous costal band, anal streak absent, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III–V orange-brown except for a moderately broad medial and 2 broad lateral longitudinal black bands over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.81 times breadth; fulvous with pale fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of small dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with large oval black spots; length of face 0.43 mm. Genae fulvous, brown subocular spot present; black bristle present. Occiput red-brown, yellow along eye margins; occipital row with 6–8 weak dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fuscous; a weak fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments; 0.45 mm; 0.48 mm; 0.90 mm.

Thorax mesonotum red-brown to fuscous except for 2 irregularly shaped lateral longitudinal black

patterns. Pleural areas black except red-brown above mid coxae and below humeral calli. Yellow markings as follows: notopleural calli; medium sized mesopleural stripe, ending midway between anterior margin of notopleural callus and anterior npl. bristle, continuing to sternopleuron as a large transverse spot, anterior margin straight; upper hypopleural calli (posterior apices black); anterior $\frac{2}{3}$ lower hypopleural calli (remainder black). Humeral calli brown. Lateral and medial postsutural vittae absent. Postnotum black. Scutellum either yellow or red-brown. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; fore and mid femora pale fuscous, hind femora with basal $\frac{1}{2}$ fulvous and apical $\frac{1}{2}$ fuscous; fore and mid tibiae pale fuscous, hind tibiae fuscous; all tarsal segments fulvous; mid tibiae each with an apical black spur.

Wings length 5.2 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band confluent with R_{4+5} and ending just beyond extremity of this vein; no dark coloured anal streak; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate; terga fused; pecten present on tergum III. Tergum I and sterna I and II longer than wide. Tergum I fuscous except for a medial longitudinal elongate black spot on posterior $\frac{1}{2}$; orange-brown along intersegmental line between terga I and II; tergum II fulvous except for a broad transverse black band across anterior $\frac{1}{2}$ and widening to cover lateral margins and a broad medial longitudinal black band; terga III–V orange-brown except for 2 broad lateral longitudinal black bands and an irregular medium to broad medial longitudinal black band over all 3 terga (these bands are connected along anterior $\frac{1}{2}$ of tergum III). A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

D. pusillus is similar to *D. capillaris* (Drew), *D. smieroides* (Walker) and *D. petioliforma* (May) in having the mesonotum red-brown or fuscous with a pattern of darker markings but differs from these species in being very small and having the costal band confluent with R_{4+5} (not overlapping this vein).

In the description above the following characters

differ from May (1965) (original characters in brackets): humeral calli brown (humeral calli yellow); scutellum either yellow or red-brown (scutellum red-brown).

***Dacus (Callantra) smieroides* (Walker)**
(Fig. 420)

Callantra smieroides Walker, 1860: 154; Bezzi, 1916: 120 (as *smicroides*, lapsus); Hardy and Adachi, 1954: 151-2; Drew, 1973: 2-6.

Dacus (Callantra) smieroides: Malloch, 1939b: 411-2.

MATERIAL EXAMINED

One ♂ labelled "type", Makassar, Celebes, A.R. Wallace; 1 ♂ and 1 ♀, bred ex *Luffa acutangula*, Tamparuli, Borneo, Jan. 1951, F. Skinner; 1 ♂, bred ex *Luffa acutangula*, Lumapu Agriculture Station, Brunei, 7.ix.1981, coll. Asman. All specimens on loan from BMNH.

LOCATION OF TYPE: 1 ♂ labelled "type" in BMNH (not a type, see COMMENTS).

DISTRIBUTION

Known from Borneo (now composed of Sabah, Sarawak, Brunei and Kalimantan) and Makassar (type locality), Sulawesi (formerly Celebes).

DIAGNOSIS

Large species; face with medium sized circular to subquadrate black spots; humeral calli yellow (posterodorsal corners tending fuscous in some specimens); notopleural calli yellow; mesonotum uniformly red-brown without dark markings, lateral and medial postsutural vittae absent, mesopleural stripe narrow, slightly wider than notopleural callus, yellow triangle extending from notopleural callus along anterior margin of mesonotal suture, scutellum yellow with broad fuscous basal band; wing with a broad fuscous costal band, anal streak absent, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III-V dark fuscous to black except for a large orange-brown spot posterocentrally on tergum IV and a medial longitudinal orange-brown band expanding along posterior margin of tergum V, abdomen extremely petiolate.

DESCRIPTION

MALE: Head generally dark fulvous. Vertical length 2.1 mm. Frons of even width, length 1.18 times breadth; dark fulvous with fuscous across lower margin and extending upwards to lateral margins; orbital bristles fuscous to black: 1 s.or.; i.or. absent; lunule dark fulvous. Ocellar triangle dark fulvous. Vertex dark fulvous. Face dark fulvous with medium sized circular to subquadrate black spots; length of face 0.7 mm. + Genae dark

fulvous, dark fuscous subocular spot present; black bristle present. Occiput pale fuscous, dark fulvous along eye margins; occipital row with a large number of well developed black bristles. Antennae with segments 1 and 2 dark fulvous (fuscous laterally), segment 3 fuscous; a strong red-brown dorsal bristle on segment 2; arista black (dark fulvous basally); length of segments: 0.48 mm; 0.48 mm; 1.40 mm.

Thorax mesonotum uniformly red-brown without dark markings. Pleural areas dark fulvous except pale fuscous to fuscous anterior and posterior to mesopleural stripe. Yellow markings as follows: humeral calli (posterodorsal corners tending fuscous in some specimens); notopleural calli; narrow mesopleural stripe slightly wider than notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; entire lower hypopleural calli; a yellow triangle extending from notopleural callus along anterior margin of mesonotal suture. Upper hypopleural calli entirely fuscous. Lateral and medial postsutural vittae absent. Postnotum fuscous. Scutellum yellow except for a broad fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 3; bristles generally well developed and black.

Legs fore and hind coxae dark fuscous, mid coxae dark fulvous; all femora fuscous to dark fuscous except mid femora fulvous on basal 1/5; all tibiae fuscous to dark fuscous; fore tarsi fuscous, mid and hind tarsi fulvous; mid tibiae each with an apical black spur.

Wings length 8.1 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band overlapping R_{4+5} ; no dark coloured anal streak; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and extremely petiolate; terga fused; pecten present on tergum III. Tergum I ca. 2.5 times longer than wide; sterna I and II longer than wide. Tergum I dark red-brown with fuscous along anterior margin and posteriorly; fulvous along intersegmental line between terga I and II; tergum II red-brown with dark fuscous to black anteriorly and along lateral margins, fulvous along posterior margin; tergum III dark fuscous to black; tergum IV dark fuscous to black except for a large orange-brown spot posterocentrally; tergum V dark fuscous to black along anterior and lateral margins and with an orange-brown medial longitudinal band which expands posteriorly to cover posterior margin. A pair of oval dark fuscous to black shining spots

on tergum V. Posterior lobe of surstylus short, sternum V with a slight concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

A description attributed to *D. smieroides* by Drew (1973) is *D. axanus* (see comments on *D. axanus*). These species are similar in the general colour patterns of the thorax, wing and abdomen. *D. smieroides* differs in having a much more petiolate abdomen, mesonotum red-brown without dark markings, abdominal terga III–V with dark fuscous to black patterns and with a dark fuscous to black band along anterior margin of tergum V dividing the central orange-brown marking.

Since Walker (1860) based his description of *C. smieroides* on a female, the male in BMNH should not be regarded as a type (see COMMENTS under *B. curvifera*).

Dacus (Callantra) solomonensis Malloch (Fig. 421)

Dacus (Callantra) solomonensis Malloch, 1939a: 236–8.
Callantra solomonensis: Drew, 1973: 6–8.

MATERIAL EXAMINED

A series of specimens in DPI (see DISTRIBUTION).
LOCATION OF TYPE: Holotype ♀ in BMNH.

DISTRIBUTION

Known from Bougainville I. and the Solomon Islands (type locality, Lunga, Guadalcanal I.).

DIAGNOSIS

Large species; face with a pair of large oval black spots; humeral calli yellow to yellow-brown; notopleural calli yellow; mesonotum dark fuscous with a large irregular red-brown area on posterior region, lateral and medial postsutural vittae absent, mesopleural stripe of medium width (extending midway between anterior margin of notopleural callus and anterior npl. bristle), yellow triangle extending along anterior margin of mesonotal suture, scutellum usually red-brown; bristles: sc. 2, prsc. absent, sa. 1; wing with a broad fuscous costal band and broad fulvous anal streak, costal cells orange-brown with dense microtrichia covering both cells; abdominal terga III and IV dull black with orange-brown along posterior margins and tergum V dark fuscous to dull black except for orange-brown medially and along posterior margin, posterior lobe of surstylus short, abdominal sternum V with a slight concavity on posterior margin.

HOST PLANTS

NEW RECORDS: Tenaru F.E.S., Guadalcanal I., Solomon Is, April 1987, C. Williams, bred ex cucumber; Kakabona Village, Guadalcanal I., August 1987, C. Williams, bred ex pumpkin.
ATTRACTANT: Cue lure.

COMMENTS

D. solomonensis was described adequately by Drew (1973) and is distinct from all other *Callantra* in possessing a large hump on abdominal tergum V.

Dacus (Callantra) unicolor (Hendel), n. comb.

Callantra unicolor Hendel, 1927b: 58–9; Drew, 1973: 8.

MATERIAL EXAMINED

None.

LOCATION OF TYPE: The holotype ♂ was placed in the Hamburg Museum, Germany and lost when this museum was destroyed by fire in 1943.

DISTRIBUTION

New Britain (type locality).

ATTRACTANT: No known record.

COMMENTS

The status of this species cannot be determined as the type has been lost (Drew, 1973) and no additional material collected. Also the original description is not satisfactory for an accurate definition of the species. Drew (1973) suggested that *D. unicolor* may be a synonym of *D. smieroides* (Walker). It now appears that the species in New Britain referred to as *D. smieroides* (Drew, 1973) is actually *D. axanus*.

KEY TO SPECIES OF SUBGENUS *CALLANTRA* (excluding *D. unicolor*)

1. Abdominal tergum V with a large hump protruding dorsally*solomonensis*
Abdominal tergum V without a hump protruding dorsally2
- 2(1). Scutellum with a broad dark fuscous to black triangle on dorsal surface3
Scutellum uniformly yellow, yellow-brown or red-brown4
- 3(2). Medial postsutural yellow vitta present on mesonotum*discors*
Medial postsutural yellow vitta absent on mesonotum*mayi*
- 4(2). Mesonotum black without paler markings5
Mesonotum mostly red-brown or fuscous with a pattern of dark markings6

- 5(4). Humeral calli fuscous; hind femora fuscous to dark fuscous*melanohumeralis*
 Humeral calli mostly yellow; hind femora fulvous with apical $\frac{1}{2}$ dark fuscous ..
*impar*
- 6(4). Costal band confluent with R_{4+5} ; mesonotum red-brown with black markings*pusillus*
 Costal band overlapping R_{4+5} ; mesonotum red-brown or fuscous with fuscous to dark fuscous patterns7
- 7(6). Abdomen strongly petiolate (tergum I with length ca. 2.5 times width)8
 Abdomen not strongly petiolate (tergum I with length ca. 1.2 times width)9
- 8(7). A row of 3–4 strong black spines on ventral surfaces of fore femora; a black spot on each eye margin level with base of antenna; facial spots elongate
*petioliforma*
 No spines on ventral surfaces of fore femora; no black spots on eye margins; facial spots circular or subquadrate
*smieroides*
- 9(7). Mesonotum with a pattern of small fuscous markings; scutellum red-brown to dark red-brown or brown; humeral callus yellow, red-brown or brown; wing with a very broad fulvous costal band overlapping R_{4+5} and darkening to fuscous beyond $r-m$ crossvein; abdominal terga orange-brown with no dark markings*capillaris*
 Mesonotum with a pattern of large, longitudinal fuscous bands; scutellum yellow, yellow-brown or red-brown; humeral callus yellow to yellow-brown; wing with a very broad fuscous costal band overlapping R_{4+5} and not darkened beyond $r-m$ crossvein; abdominal terga I and II orange-brown with a fuscous tinge, terga III–V fuscous with orange-brown along posterior and lateral margins and with a large medial orange-brown spot across intersegmental line between terga IV and V*axanus*

Subgenus **Dacus** Fabricius

Dacus (Dacus) absonifacies (May) (Figs 422, 423)

Polistomimetes absonifacies May, 1955: 156–8.

Dacus absonifacies: May, 1963: 41–2, 49.

MATERIAL EXAMINED

AUSTRALIA, Queensland: holotype σ ; 3 σ paratypes (ex lure in citrus), Stanthorpe, 21.x.1953; 1 σ paratype, (ex lure in avocado), Brisbane, 5.x.1953; 1 \varnothing paratype (bred from *Marsdenia rostrata*), Mt Glorious, Dec. 1952; 1 \varnothing paratype (ex lure in citrus), Gatton, Sept. 1951; all paratypes in DPI collected by A.W.S. May.

LOCATION OF TYPE: Holotype (T.5305) in QM.

DISTRIBUTION

Known only from south-east Queensland where it is common at high altitudes; type locality, Stanthorpe.

DIAGNOSIS

Medium sized species; large elongate black facial spots present; humeral calli fuscous; notopleural calli yellow; mesonotum fuscous, mesopleural stripe narrow, equal in width to notopleural callus, lateral and medial postsutural vittae absent, scutellum yellow; wing with a broad fuscous costal band (confluent with M and broad fuscous anal streak, costal cells fuscous with dense microtrichia covering both cells; abdominal terga III–V generally fuscous except for narrow longitudinal pale fuscous to orange-brown bands each side of a moderately broad medial longitudinal fuscous band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.7 mm. Frons narrowing slightly posteriorly, length 1.33 times breadth; fulvous with, at most, pale fuscous around i.or. bristles; anteromedial hump with just a few short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex dark fuscous. Face fulvous with large elongate black spots $\frac{2}{3}$ the length of the antennal furrow; length of face 0.6 mm. Genae fulvous, pale fuscous subocular spot present; fuscous bristle present. Occiput fuscous, yellow along eye margins; occipital row with a large number of short pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.15 mm; 0.35 mm; 0.85 mm.

Thorax mesonotum fuscous with often a blotched pattern due to sites of attachment of dorsoventral flight muscles. Pleural areas dark fuscous except paler below humeral calli. Yellow markings as follows: notopleural calli; narrow mesopleural stripe, equal in width to notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; a

triangular mark along anterior margin of mesonotal suture with base on notopleural calli; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous). Lateral and medial postsutural vittae absent. Humeral calli fuscous. Postnotum dark fuscous. Scutellum yellow except for broad fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae dark fuscous; fore and mid femora fuscous, apical $\frac{1}{2}$ hind femora fuscous (remainder fulvous); all tibiae fuscous; all tarsal segments fulvous; mid tibiae each with an apical black spur.

Wings length 5.9 mm; costal cells fuscous; dense microtrichia covering both costal cells; remainder of wings with a pale fuscous tint, except fuscous subcostal cell, broad fuscous costal band confluent with M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga fused; pecten present on tergum III. Tergum I and sterna I and II as wide as long. Tergum I fuscous; tergum II fuscous except for a narrow transverse fulvous spot along posterior margin each side of mid-line; terga III–V fuscous except for narrow longitudinal bands either side of a moderately broad medial longitudinal fuscous band (these lateral bands are pale fuscous on tergum III and orange-brown on terga IV and V). A pair of oval orange-brown shining spots on tergum V. The medial longitudinal fuscous band generally extends onto tergum II. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, cylindrical and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 1:1. Apex of piercer laterally compressed. Spicules at distal end of middle segment with a small number of very large thick dentations, 1 always much larger (Fig. 423).

ATTRACTANT: Cue lure.

COMMENTS

D. absonifacies from all other South Pacific species of the subgenus *Dacus* in possessing a very broad costal band which is confluent with M for its entire length and in having fuscous humeral calli.

Dacus (Dacus) alarifumidus, n. sp. (Fig. 424)

TYPE SPECIMENS

Holotype σ , PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute, attracted to cue lure, 15.vi.1980, R.A.I. Drew and D.W. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 σ , Wau Ecology Institute, 15.vi.1980, R.A.I. Drew and D.W. Currey; 1 σ , Namie Creek (1600 m) and 1 σ , Pitpit Gully (1550 m), Mt Kaindi, 1.xii.1980, A. Allison; 3 σ , Pitpit Gully (1550 m) and 2 σ , Barker Plantation (1750 m), Mt Kaindi, 15.xii.1980, A. Allison; 1 σ , Car Park (1350 m), Mt Missim, 15.xii.1980, A. Allison; 1 σ , Watut Village (1500 m), 1 σ , Namie Creek (1650 m), 5 σ , Pitpit Gully (1550 m); 9 σ , Kunai Creek (1450 m), Mt Kaindi, 29.xii.1980, A. Allison. All attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10457) and 1 paratype (T.10458) in QM; 4 paratypes in ANIC; 4 paratypes in BMNH; 1 paratype in DPI(PNG); 15 paratypes in DPI.

DISTRIBUTION

Known only from the Wau area, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with a pair of large irregularly shaped black spots; humeral and notopleural calli yellow; mesonotum dark fuscous (tending red-brown along lateral margins), lateral postsutural vittae absent, medial postsutural vitta present, mesopleural stripe narrow (just wider than notopleural callus), yellow triangle extending from notopleural callus along anterior margin of mesonotal suture, scutellum yellow with a narrow dark basal band; wing with a general fuscous tint, a broad dark fuscous costal band and anal streak, costal cells fuscous with microtrichia covering both cells; abdominal terga III–V orange-brown with 2 broad lateral and 1 broad medial longitudinal black bands.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.43 mm. Frons narrowing slightly posteriorly, length 1.29 times breadth; fulvous with dark fuscous to black around orbital bristles and fuscous on anteromedial hump; latter covered with short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule dark fulvous to fuscous. Ocellar triangle black. Vertex dark fuscous to black. Face fulvous with large irregularly oval black facial spots reaching epistoma; length of face 0.43 mm. Genae fulvous, large black subocular spot present; black bristle present. Occiput dark fuscous, fulvous along eye margins; occipital row with a large number of small pale bristles. Antennae with

segments 1 and 2 dark fulvous, segment 3 fulvous with dark fuscous to black on apex and outer surface; a fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.24 mm; 0.32 mm; 0.84 mm.

Thorax mesonotum dark fuscous, tending red-brown along lateral margins. Pleural areas dark fuscous except fuscous below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; a triangle extending along anterior margin of mesonotal suture from notopleural callus; narrow mesopleural stripe just wider than notopleural callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices dark fuscous to black); anterior $3/5$ lower hypopleural calli (remainder dark fuscous to black); a medial longitudinal postsutural vitta, from level of lower pa. bristles to level of mesonotal suture. Lateral postsutural vittae absent. Postnotum dark fuscous. Scutellum yellow with a narrow fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent in holotype, present but weak in paratype; mpl. 1; npl. 2; scp. 2-4; all bristles well developed and black except sa. and some scp.

Legs coxae dark fuscous; fore femora fuscous to dark fuscous, mid femora dark fuscous, hind femora with basal $1/2$ fulvous and apical $1/2$ dark fuscous; fore and mid tibiae fulvous, hind tibiae fuscous; tarsi fulvous; mid tibiae each with an apical black spur; fore femora with rows of long pale setae on dorsal surfaces.

Wings length 5.7 mm; costal cells fuscous, microtrichia covering both costal cells; remainder of wings with a fuscous tint, becoming paler towards wing base, a dark fuscous subcostal cell, a broad dark fuscous costal band confluent with R_{4+5} and merging with the fuscous tint across the wing, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval to clavate but not strongly petiolate; terga fused; pecten present on tergum III; tergum I as long as it is wide; sterna I and II longer than wide. Terga covered with a dense golden pubescence. Tergum I black except for small transverse orange-brown spots on posterior margin each side of a medial longitudinal black band; tergum II black except for large transverse orange-brown spots posteriorly each side of a medial longitudinal black band; terga III-V orange-brown with 2 broad lateral longitudinal black bands joining on tergum III and extending over all 3 terga, and a broad medial longitudinal black band running from base of tergum III to end

just before posterior margin of tergum V. A pair of oval shining spots on tergum V. Posterior lobe of surstylus short, sternum V with posterior margin straight.

ATTRACTANT: Cue lure.

COMMENTS

D. alarifumidus is similar to *D. badius* and *D. concolor* in possessing a medial postsutural yellow vitta on the mesonotum and a broad costal band of uniform width. It differs from these species in having a dark fuscous mesonotum, abdominal terga with medial and lateral longitudinal black bands, humeral calli entirely yellow and a narrow mesopleural stripe equal in width to notopleural callus.

Dacus (Dacus) alulapictus, n. sp.

(Fig. 425)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Stony logging area, Bulolo, collected under leaf of *Musa* sp., 3.viii.1979, H. Ivagai.

Paratype ♂, PAPUA NEW GUINEA, Morobe Province: Robbies Creek, Bulolo, collected under leaf of *Musa* sp., 26.vii.1979, H. Ivagai.

LOCATION OF TYPES: Holotype (T.10459) in QM; paratype in DPI.

DISTRIBUTION

Known only from the Bulolo area, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with large oval black spots; humeral and notopleural calli yellow; mesonotum red-brown to pale fuscous with a mottled appearance, medial longitudinal postsutural vitta present, lateral postsutural vittae absent, mesopleural stripe broad reaching humeral callus, a triangular yellow marking along anterior margin of mesonotal suture, scutellum yellow with a broad triangular pale fuscous marking; wing with a dark fuscous costal band which expands into a large dark fuscous spot covering apical $1/3$ of wing and a narrow transverse dark fuscous band across wing, costal cells colourless, microtrichia around outer and anterior margins of second cell only; abdominal terga I-IV orange-brown and tergum V dark fuscous to black.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.78 mm. Frons narrowing slightly posteriorly, length 1.41 times breadth; fulvous with dark fuscous around orbital bristles and fuscous on

anteromedial hump; latter covered by a large number of short dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex fuscous. Face fulvous with large oval black spots almost reaching to epistoma; length of face 0.63 mm. Genae fulvous, large dark fuscous to black spot present; black bristle present. Occiput pale fuscous, yellow along eye margins; occipital row with 4–7 well developed black bristles and a large number of smaller dark bristles. Antennae with segments 1 and 2 pale fuscous, segment 3 fuscous except fulvous on inner basal surface; a pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.35 mm; 0.40 mm; 1.18 mm.

Thorax mesonotum red-brown to pale fuscous with a mottled appearance resulting from sites of attachment of the dorsoventral flight muscles. Pleural areas red-brown to pale fuscous. Yellow markings as follows: humeral calli; notopleural calli; a broad mesopleural stripe reaching humeral callus dorsally, continuing to sternopleuron as a transverse spot, anterior margin slightly concave; a triangular marking along anterior margin of each mesonotal suture, with base at notopleural callus and apex at inner margin of suture; a short narrow medial longitudinal postsutural vitta rounded posteriorly and narrowing to a point anteriorly; upper hypopleural calli (posterior apices red-brown to pale fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown to pale fuscous). Lateral postsutural vittae absent. Postnotum red-brown to pale fuscous. Scutellum yellow with a broad triangular pale fuscous pattern on dorsal surface. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae fuscous, mid and hind coxae pale fuscous; all femora, tibiae and tarsi fulvous; fore femora with a row of long pale setae on dorsal surface; mid tibiae each with an apical black spur.

Wings length 7.0 mm; costal cells colourless, microtrichia adjacent to outer and anterior margins of second cell only; remainder of wings colourless except for a dark fuscous costal band which expands into a large dark fuscous spot across apical $\frac{1}{3}$ of wing, a narrow dark fuscous transverse band across wing enclosing r–m crossvein and posterior $\frac{1}{2}$ of dm–cu crossvein; anal streak absent but with pale fuscous in anal cell extension; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga fused; pecten present on tergum III. Tergum I wider than long; sterna I and II slightly longer than wide. Terga I–IV orange-brown without dark markings; tergum V dark fuscous anteriorly and black posteriorly. Oval

shining spots on tergum V not visible. Posterior lobe of surstylus of medium length, sternum V with a slight concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

D. alulapictus is similar to other species of subgenus *Dacus* in having the costal band not confluent with M and humeral calli entirely or mostly yellow but differs in possessing a narrow transverse fuscous band across centre of wing, a large fuscous spot over apex of wing and a fuscous triangle on dorsal surface of scutellum.

Dacus (Dacus) badius, n. sp. (Fig. 426)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Wau Ecology Institute (1150 m), deserted garden (Allison's), attracted to Willison's lure, 3–10.iv.1965, E.N. Marks.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Ant Plant Gully (1200 m), Mt Missim, 18.xii.1980, A. Allison; 1 ♂, Wau Ecology Institute (1230 m), 24.xi.1980, A. Allison; 1 ♂ (1200 m), 5.x.1981, 1 ♂ (1350 m), 16.ii.1981, 1 ♂ (1450 m), 7.iv.1981, 1 ♂ (1450 m), 27.iv.1981, 1 ♂ (1450 m), 14.xii.1981, 1 ♂ (1500 m), 23.xi.1981, Mt Kaindi, A. Allison; 1 ♂, Stony logging area, Bulolo, collected on leaf of ginger, 23.iii.1979, H. Ivagai. East Sepik Province: 1 ♂, Maprik, Oct.–Dec. 1957, Malaria Control Section. All paratypes except 2 attracted to cue lure.

LOCATION OF TYPES: Holotype (T.10460) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 7 paratypes in DPI.

DISTRIBUTION

Known only from Morobe and East Sepik Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with large circular black spots; humeral calli with posterior $\frac{2}{3}$ yellow (anterior $\frac{1}{3}$ fuscous); notopleural calli yellow; mesonotum red-brown with a mottled appearance, medial longitudinal postsutural vitta present, lateral postsutural vittae absent, mesopleural stripe broad (reaching midway between anterior npl. bristle and humeral callus), a triangular yellow marking along anterior margin of mesonotal suture, scutellum yellow; wing with a broad fuscous costal band overlapping R_{4+5} , costal cells fuscous and covered with microtrichia; abdomen with a diffuse medial longitudinal dark fuscous band over all terga and with terga III–V orange-brown with broad lateral longitudinal red-brown bands.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.68 mm. Frons narrowing slightly posteriorly, length 1.56 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump; latter covered with a small number of short dark setae; orbital bristles well developed and black: 1 s.or., 2 i.or. (3 on 1 side in holotype); lunule pale fuscous. Ocellar triangle black. Vertex fulvous. Face fulvous with large circular black facial spots not reaching epistoma; length of face 0.48 mm. Genae fulvous, large fuscous to dark fuscous subocular spot present; black bristle present. Occiput fulvous, yellow along eye margins; occipital row with a large number of pale bristles. Antennae with segments 1 and 2 pale fuscous, segment 3 fulvous except fuscous on apex and outer surface; a weak pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.38 mm; 0.48 mm; 1.05 mm.

Thorax mesonotum red-brown with a mottled appearance due to sites of attachment of dorsoventral flight muscles. Pleural areas red-brown to pale fuscous. Yellow markings as follows; posterior $\frac{2}{3}$ humeral calli (anterior $\frac{1}{3}$ fuscous); notopleural calli; broad mesopleural stripe reaching midway between anterior npl. bristle and humeral callus dorsally, extending to sternopleuron as an oval spot, anterior margin straight or slightly concave; a triangular marking along anterior margin of each mesonotal suture, with base at notopleural callus and apex at inner margin of each suture; a moderately broad medial longitudinal postsutural vitta rounded posteriorly at level of upper pa. bristles and pointed anteriorly (just anterior of mesonotal suture); upper hypopleural calli (dorsal and posterior apices fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder fuscous). Lateral postsutural vittae absent. Postnotum red-brown. Scutellum yellow except for a narrow pale fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs fore coxae pale fuscous, mid and hind coxae red-brown; all femora fulvous, tending red-brown on apical $\frac{1}{3}$; fore and hind tibiae fulvous tending pale fuscous proximally, mid tibiae fulvous; all tarsi fulvous; mid tibiae each with an apical black spur; fore femora with a row of long pale setae on dorsal surface.

Wings length 6.9 mm; costal cells fuscous, dense microtrichia covering second costal cell and most of first costal cell; remainder of wings colourless except for fuscous subcostal cell, broad fuscous costal band becoming paler as it overlaps R_{4+5} , broad fuscous anal streak ending at wing margin;

dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval, terga fused, pecten present on tergum III. Tergum I wider than long; sterna I and II slightly longer than wide. Terga I and II red-brown, tending whitish posteriorly on tergum II and with a diffuse medial longitudinal dark fuscous band on both terga; terga III–V orange-brown with broad lateral longitudinal red-brown bands and with a diffuse medial longitudinal dark fuscous band which is continuous with the black band on terga I and II. A pair of oval shining spots on tergum V. Posterior lobe of surstylus of medium length, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure; Willison's lure.

COMMENTS

D. badius is similar to *D. concolor* in possessing a red-brown mesonotum, abdominal terga of uniform pale colouration, humeral calli yellow with anterior $\frac{1}{3}$ fuscous and mesopleural stripe extending to anterior npl. bristle. It differs from this species in having the wing membrane colourless, the costal band uniformly overlapping R_{4+5} and all femora fulvous with apices red-brown.

***Dacus (Dacus) bellulus* Drew and Hancock
(Fig. 427)**

Dacus (Dacus) bellulus Drew and Hancock, 1981: 50–1.

MATERIAL EXAMINED

A large series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.8214) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: Coastal areas of the Northern Territory and Cape York Peninsula (type locality, near Laura), Queensland and Moa (Banks) (Torres Strait islands).

NEW RECORDS: Torres Strait islands: Badu, Boigu, Horn, Sue, Thursday, Yam, Yorke (records from Plant Quarantine Survey). Papua New Guinea: 20 km SE Port Moresby, 26.iii.1983, J.W. Ismay.

DIAGNOSIS

Small species; facial spots present in shape of small narrow vertical lines; humeral and notopleural calli yellow; mesonotum red-brown, mesopleural stripe reaching to anterior npl. bristle, lateral and medial postsutural vittae absent, yellow triangle above notopleural calli and running along anterior margin of mesonotal suture, scutellum

yellow; wing with a narrow fuscous costal band and anal streak, costal cells fuscous with dense microtrichia covering both cells; all abdominal terga orange-brown without dark markings.

ATTRACTANT: Cue lure.

COMMENTS

D. bellulus is similar to *D. newmani* (Perkins) and *D. signatifrons* (May) in having a narrow costal band confluent with or just overlapping R_{2+3} . It differs from *D. newmani* in possessing dark facial spots, broader mesopleural stripes reaching npl. bristles and mesonotum uniformly red-brown and from *D. signatifrons* in having the facial spots small and narrow, costal band confluent with R_{2+3} and hind tibiae fulvous.

Dacus (Dacus) concolor, n. sp. (Fig. 428)

TYPE SPECIMENS

Holotype ♂, AUSTRALIA, north Queensland: Bamaga airstrip, attracted to cue lure, 13.iv.1981, D. Currey.

Paratypes, AUSTRALIA, north Queensland: 4 ♂♂, Bamaga airstrip, attracted to cue lure, 13.iv.1981, D. Currey. LOCATION OF TYPES: Holotype (T.10461) in QM; 1 paratype in ANIC; 3 paratypes in DPI.

DISTRIBUTION

Known only from Bamaga, Cape York, north Queensland.

DIAGNOSIS

Medium sized species; medium sized circular facial spots present; humeral calli yellow (anterior $\frac{1}{3}$ fuscous); notopleural calli yellow; mesonotum red-brown, mesopleural stripe of medium width reaching almost to anterior npl. bristle above, lateral postsutural vittae absent, medial postsutural vitta present, a yellow triangular band along anterior margin of mesonotal suture, scutellum yellow; legs entirely fulvous; wing with a broad fuscous costal band extending as a pale tint across entire wing membrane and a broad fuscous anal streak, costal cells fuscous and covered with dense microtrichia; abdominal terga II–V fulvous except for a broad transverse dark red-brown band across anterior margin of tergum II, a narrow medial longitudinal pale fuscous band over all 4 terga and broad dark red-brown lateral longitudinal bands over terga III–V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.7 mm. Frons of even width, length 1.62 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of

short pale setae; orbital bristles red-brown: 1 s.or., 2 or 3 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous with medium sized circular black spots; length of face 0.53 mm. Genae fulvous, subocular spot absent; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 4–8 well developed red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.38 mm; 0.40 mm; 1.13 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: posterior $\frac{2}{3}$ humeral calli (anterior $\frac{1}{3}$ including broad ventral margin fuscous); notopleural calli; medium sized mesopleural stripe, reaching almost to anterior npl. bristle dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); a narrow medial longitudinal postsutural vitta; a yellow triangular band running along anterior margin of mesonotal suture and with base at notopleural callus. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Lateral postsutural vittae absent. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and dark fuscous.

Legs all segments fulvous without dark markings; rows of long fulvous setae on dorsal surface of fore femora; mid tibiae each with an apical black spur.

Wings length 6.4 mm; costal cells fuscous; dense microtrichia covering second costal cell and most of first costal cell; remainder of wings with a broad fuscous costal band which expands into a pale tint across the entire membrane, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga fused; pecten present on tergum III. Tergum I and sterna I and II wider than long. Tergum I dark red-brown; terga II–V fulvous except for a broad transverse dark red-brown band along anterior margin of tergum II and expanding to cover lateral margins of that tergum, a narrow medial longitudinal pale fuscous band over all 4 terga, broad lateral longitudinal dark red-brown bands over terga III–V. A pair of oval pale fuscous shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. concolor is similar to *D. badius* in possessing a red-brown mesonotum, a pale coloured abdomen without black patterns, mesopleural stripe extending to anterior npl. bristle and humeral calli yellow (except anterior $\frac{1}{3}$ fuscous). It differs from this species in possessing a pale fuscous tint over wing membrane, costal band confluent with R_{4+5} and all femora uniformly fulvous.

***Dacus (Dacus) newmani* (Perkins)**
(Fig. 429)

Neodacus newmani Perkins, 1937: 58–9.

Dacus newmani: May, 1963: 41, 49.

MATERIAL EXAMINED

AUSTRALIA: lectotype ♀, labelled holotype, Carnarvon, Western Australia, September 1929, I.M. Mackerras; 2 ♂ and 5 ♀ paralectotypes labelled paratype, native fruits, Carnarvon, Western Australia, 1918, Newman; a large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPES: Lectotype (T.8586) in QM; paralectotypes in UQ.

DISTRIBUTION

D. newmani is common in semi-arid regions of east, north-west (type locality, Carnarvon) and central Australia. It is distinct among the Dacinae in not occurring in the wet coastal areas. Although its host is unknown it is unlikely that the pupae could survive in soil in such hot dry localities. It probably has a behaviour similar to *D. aequalis* Coquillett pupating within the host fruit which remain on the plant.

DIAGNOSIS

Small species; facial spots absent; humeral and notopleural calli yellow; mesonotum uniformly red-brown, mesopleural stripe of medium width extending to anterior npl. bristle, lateral postsutural vittae absent, medial postsutural vitta reduced to a small elongate yellow spot, a broad yellow triangle along anterior margin of mesonotal suture with base at notopleural calli, scutellum yellow; legs fulvous with hind tibiae pale fuscous; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells fuscous (second cell paler), dense microtrichia covering both costal cells; abdominal terga uniformly red-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.3 times breadth; fulvous without dark markings; anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2

i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous, facial spots absent; length of face 1.3 mm. Genae fulvous, small pale brown subocular spot present; black bristle present. Occiput red-brown, yellow along eye margins; occipital row with a large number of short pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong fuscous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.28 mm; 0.63 mm.

Thorax mesonotum and pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin convex; upper hypopleural calli (posterior apices red-brown); anterior 7/10 lower hypopleural calli (remainder red-brown); medial postsutural vitta reduced to a small elliptical spot; a triangular marking along anterior margin of mesonotal suture with base at notopleural calli. Lateral postsutural vittae absent. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all segments fulvous except hind tibiae pale fuscous; mid tibiae each with an apical black spur.

Wings length 4.7 mm; costal cells fuscous (second cell paler); dense microtrichia covering both costal cells; remainder of wings colourless, except fuscous subcostal cell, narrow fuscous costal band confluent with R_{2+3} and expanding beyond extremity of this vein into an irregular apical spot, broad fuscous anal streak ending before wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga fused; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga uniformly red-brown without dark markings. A pair of oval red-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment fuscous, dorsoventrally compressed and tapering posteriorly in dorsal view. Ratio of length of ov scape to length of tergum V 0.38:1.

ATTRACTANT: Cue lure.

COMMENTS

D. newmani is similar to *D. bellulus* Drew and Hancock and *D. signatifrons* (May) in possessing a narrow costal band confluent with or just overlapping R_{2+3} but differs from these species in having facial spots absent, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, mesonotum rich chocolate brown with a central elliptical yellow spot. Originally, Perkins (1937) listed collection data for the specimens studied but did not designate types. There is no doubt that the type series consisted of the specimens noted above, labelled holotype and paratypes. I designate the specimen labelled holotype as lectotype and the 7 labelled paratype as paralectotypes.

Dacus (Dacus) secamoneae, n. sp.
(Figs 430–432)

TYPE SPECIMENS

Holotype ♂, AUSTRALIA, Northern Territory: Fogg Dam, 14.vi.1985, G. Crawford.

Paratypes, AUSTRALIA, Northern Territory: 2 ♀♀ and 1 ♂, Fogg Dam, 14.vi.1985, G. Crawford; 1 ♀ and 1 ♂, 5.v.1976, 1 ♀, 25.iii.1976, 20 km S of Dunmarra, bred ex *Secamone elliptica*, A. Allwood; 2 ♂♂, Yirrkala Mission, Gove Peninsula, attracted to cue lure, 20.iv.1982, A. Allwood. LOCATION OF TYPES: Holotype (T.10462) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 5 paratypes in DPI.

DISTRIBUTION

Known only from the Northern Territory.

DIAGNOSIS

Medium sized pale coloured species; large oval facial spots present; humeral calli red-brown; notopleural calli yellow; mesonotum red-brown, lateral and medial postsutural vittae absent, mesopleural stripe narrow equal in width to notopleural callus, scutellum yellow; wing with a broad fuscous costal band expanding apically to overlap M and a narrow fuscous anal streak, costal cells fuscous, microtrichia covering both costal cells; abdominal terga III–V fulvous except for 2 broad lateral longitudinal red-brown bands and a narrow medial longitudinal pale fuscous band which meet along anterior margin of tergum III.

DESCRIPTION

FEMALE: Head generally fulvous. Vertical length 1.7 mm. Frons of even width, length 1.71. times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short black setae; orbital bristles black: 1 s.or., 2 i.or.; lunule red-brown.

Ocellar triangle black. Vertex fulvous. Face fulvous with large oval black spots reaching epistoma; length of face 0.45 mm. Genae fulvous, large fuscous subocular spot present; black bristle present. Occiput fulvous; occipital row with a large number of small bristles. Antennae with segments 1 and 2 fulvous, segment 3 fuscous; a weak fulvous dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.48 mm; 0.50 mm; 1.08 mm.

Thorax mesonotum red-brown with paler markings resulting from attachment of dorsoventral flight muscles. Pleural areas red-brown without dark markings. Yellow markings as follows: notopleural calli; narrow mesopleural stripe equal in width to notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; triangular marking along anterior margin of each mesonotal suture, with base at notopleural callus and apex at inner margin of each suture; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown). Humeral calli red-brown. Lateral and medial postsutural vittae absent. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 4; all bristles weak and black.

Legs all coxae red-brown; all other segments red-brown except basal $\frac{1}{2}$ of fore femora, basal $\frac{2}{3}$ hind femora and all tarsi fulvous; rows of long dark setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.9 mm; costal cells fuscous, microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, broad fuscous costal band which expands apically to overlap M, narrow fuscous anal streak ending before wing margin; no dense aggregation of microtrichia around $A_1 + CuA_2$, supernumerary lobe weak.

Abdomen elongate-oval; terga fused; pecten on tergum III absent. Tergum I slightly wider than long; sterna I and II as wide as long. Terga I and II red-brown except for 2 transverse fulvous markings on posterior margin of tergum II. Terga III–V fulvous except for 2 broad lateral longitudinal red-brown bands which meet along anterior margin of tergum III and a very narrow medial longitudinal pale fuscous band over all 3 terga. A pair of oval fulvous shining spots on tergum V. Basal segment of ovipositor red-brown, dorsoventrally compressed and narrowing posteriorly in dorsal view; ratio of length of oviscape to length of tergum V 0.93:1; apex of piercer strongly sclerotized, red-brown, needle

shaped at its tip with 3 pairs of short subapical bristles (Fig. 431). Spicules at distal end of middle segment with irregularly shaped broad flat teeth extremely variable in size (Fig. 432).

MALE: As for female except dense aggregation of microtrichia around $A_1 + CuA_2$ present; pecten present on abdominal tergum III; posterior lobe of surstylus long; abdominal sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. secamoneae is similar to *D. alarifumidus*, *D. badius* and *D. concolor* in possessing a broad costal band confluent with or overlapping R_{4+5} but differs from these species in lacking a medial postsutural yellow vitta and having the costal band expanded beyond the centre of the wing to overlap M.

Dacus (Dacus) signatifrons (May) (Fig. 433)

Neodacus signatifrons May, 1955: 155–6.

Dacus signatifrons: May, 1963: 41, 49.

MATERIAL EXAMINED

AUSTRALIA, Queensland: holotype ♂, Brisbane, 12.x.1953, A.W.S. May; large series of specimens in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype (T.5307) in QM.

DISTRIBUTION

Restricted to coastal and sand island habitats along the coast of southern Queensland; type locality, Brisbane.

DIAGNOSIS

Small to medium sized species; long narrow black facial spots present; humeral and notopleural calli yellow; mesonotum pale fuscous, mesopleural stripe reaching anterior npl. bristle, lateral and medial postsutural vittae absent, broad yellow triangle above notopleural calli and running along anterior margin of mesonotal suture, scutellum yellow; wing with a narrow dark fuscous costal band expanding apically and a broad fuscous anal streak, costal cells dark fuscous with dense microtrichia covering both costal cells; all abdominal terga uniformly red-brown.

DESCRIPTION

MALE: Head generally red-brown. Vertical length 1.6 mm. Frons narrowing slightly posteriorly, length 1.54 times breadth; red-brown without dark markings; anteromedial hump covered by a small number of short pale setae;

orbital bristles black: 1 s.or., 2 i.or.; lunule red-brown. Ocellar triangle black. Vertex fuscous. Face fulvous with long elongate black facial spots filling most of antennal furrow; length of face 0.58 mm. Genae red-brown; black bristle present. Occiput red-brown, yellow along eye margins; occipital row with a large number of small pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.13 mm; 0.30 mm; 0.78 mm.

Thorax mesonotum pale fuscous with a mottled appearance from sites of attachment of dorsoventral flight muscles. Pleural areas pale fuscous, darker on sternopleuron and behind mesopleural stripe. Yellow markings as follows: humeral calli; notopleural calli; medium sized mesopleural stripe, reaching to anterior npl. bristle dorsally, continuing to sternopleuron as a large transverse spot, anterior margin slightly convex; upper hypopleural calli (posterior apices dark fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder dark fuscous); a broad triangular marking with base on notopleural callus and running along anterior margin of mesonotal suture. Lateral and medial postsutural vittae absent. Postnotum dark fuscous. Scutellum yellow with a narrow fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. 1; mpl. 1; npl. 2; scp. 2 or 3; all bristles well developed and black.

Legs fulvous except fore and mid tibiae pale fuscous and hind tibiae fuscous; basal $\frac{1}{2}$ of hind femora tending paler fulvous; mid tibiae each with an apical black spur.

Wings length 5.4 mm; costal cells dark fuscous; dense microtrichia covering both costal cells; remainder of wings colourless except dark fuscous subcostal cell, narrow dark fuscous costal band confluent with R_{2+3} and expanding beyond extremity of this vein to end between extremities of R_{4+5} and M, a broad dark fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen oval; terga fused; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga uniformly red-brown. A pair of oval red-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. signatifrons is similar to *D. bellulus* Drew and Hancock in possessing elongate facial spots, broad

mesopleural stripe reaching anterior npl. bristle dorsally and a uniformly red-brown mesonotum. It differs from this species in having facial spots large and distinct, hind tibiae fuscous and costal band overlapping R₂₊₃.

KEY TO SPECIES OF SUBGENUS *DACUS*

1. Costal band confluent with M for entire length; humeral calli fuscous*absonifacies*
Costal band not confluent with M for entire length; humeral calli yellow or mostly yellow2
- 2(1). Scutellum with a fuscous triangle on dorsal surface; wing with a narrow fuscous transverse band across centre and a large fuscous spot across apex....*alulapictus*
Scutellum entirely yellow; wing not marked as above3
- 3(2). Costal band narrow, confluent with or just overlapping R₂₊₃4
Costal band broad, confluent with or overlapping R₄₊₅6
- 4(3). Facial spots absent; mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle; mesonotum rich chocolate brown with a central elliptical yellow spot posterior to mesonotal suture*newmani*
Elongate facial spots present; mesopleural stripe broad and attaining anterior npl. bristle dorsally; mesonotum uniformly red-brown or dark brown5
- 5(4). Facial spots small and narrow (occasionally absent); hind tibiae fulvous; costal band not overlapping R₂₊₃*bellulus*
Facial spots distinct and elongate, hind tibiae fulvous; costal band overlapping R₂₊₃*signatifrons*
- 6(3). Medial postsutural vitta absent; costal band expanded beyond centre of wing to overlap M*secamoneae*
Medial postsutural vitta present; costal band of uniform width7
- 7(6). Humeral calli entirely yellow; wing with membrane fuscous and costal band confluent with R₄₊₅; mesopleural stripe narrow, equal in width to notopleural callus; mesonotum dark fuscous; abdomen with a medial and 2 broad lateral longitudinal black bands joined along anterior margin of tergum III ..
.....*alarifumidus*

- Humeral calli yellow except anterior 1/3 fuscous; wing membrane not generally fuscous; mesopleural stripe broad, extending to anterior npl. bristle; mesonotum red-brown; abdomen without black markings8
- 8(7). Wing membrane colourless with costal band uniformly overlapping R₄₊₅; all femora fulvous with apices red-brown
.....*badius*
Wing membrane with pale fuscous tint and costal band confluent with R₄₊₅; all femora uniformly fulvous*concolor*

Subgenus *Didacus* Collart

Dacus (Didacus) aequalis Coquillett (Figs 434–436).

Dacus aequalis Coquillett, 1909: 794–5.
Chaetodacus aequalis: Tryon, 1927: 191–2.
Callantra aequalis: Perkins, 1934: 44; May, 1963: 40, 49.

MATERIAL EXAMINED

A large number of specimens in DPI (see DISTRIBUTION); types in NMNH.

LOCATION OF TYPES: Lectotype ♀ and paralectotype ♂ in NMNH.

DISTRIBUTION

Common along the eastern coast of Queensland and northern New South Wales, particularly associated with rainforests. Type locality, Tuggerah Lakes, New South Wales. Recently, 1 specimen was collected near Wilcannia, New South Wales, approximately 750 km from the nearest rainforest host area.

DIAGNOSIS

Large wasp-like species; facial spots large and elongate; humeral calli fuscous; notopleural calli yellow; mesonotum red-brown to fuscous with irregular blotched markings, triangular yellow markings along anterior margin of mesonotal suture, lateral and medial postsutural vittae absent, mesopleural stripe narrow equal in width to notopleural callus, scutellum yellow with a broad triangular fuscous basal band; wing with a very broad fuscous costal band (confluent with M) and anal streak, costal cells fuscous and covered with dense microtrichia; abdomen mostly fuscous with a large oval red-brown spot on centre of tergum V.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 2.0 mm. Frons narrowing slightly posteriorly, length 1.32 times breadth; fulvous with pale

fuscous around orbital bristles and on anteromedial hump, latter covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle black. Vertex pale fuscous. Face fulvous with large elongated black spots; length of face 0.68 mm. Genae fulvous, small brown subocular spot present; red-brown bristle present. Occiput red-brown, yellow along eye margins; occipital row with 6–7 weak pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with pale fuscous on apex and outer surface; a strong red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.28 mm; 0.45 mm; 1.15 mm.

Thorax mesonotum red-brown to fuscous with irregular blotched markings resulting from sites of attachment of dorsoventral flight muscles. Pleural areas pale fuscous except red-brown below humeral calli. Yellow markings as follows: notopleural calli; narrow mesopleural stripe, equal in width to notopleural callus dorsally, continuing to sternopleuron as a small transverse spot, anterior margin straight; anterior corner of upper hypopleural calli (remainder red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder including broad ventral margins red-brown); a narrow triangular marking running along anterior margin of mesonotal suture with base on notopleural calli and apex at inner margin of suture. Lateral and medial postsutural vittae absent. Humeral calli fuscous. Postnotum red-brown. Scutellum yellow except for a broad triangular fuscous basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 2; bristles generally weak and fuscous.

Legs fore coxae fuscous, mid and hind coxae dark fuscous; femora fuscous to dark fuscous, tibiae fuscous, all tarsal segments fulvous; mid tibiae each with an apical black spur.

Wings length 8.1 mm; costal cell fuscous; dense microtrichia covering both costal cells; remainder of wings with a pale fuscous tint, except fuscous subcostal cell, very broad fuscous costal band confluent with M, broad fuscous anal streak which merges into pale fuscous at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate; terga fused; pecten present on tergum III. Tergum I and sterna I and II longer than wide. Tergum I fuscous; tergum II fuscous anterocentrally, fulvous across posterior margin and around lateral margins; terga III–V fuscous except for a narrow medial longitudinal pale fuscous band over anterior $\frac{2}{3}$ of tergum V, the posterocentral area of tergum V red-

brown changing to orange-brown around posterior margin. A pair of oval red-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

FEMALE: As for male except no dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak; no pecten present on abdominal tergum III.

Ovipositor basal segment red-brown, elongate and almost circular in transverse cross section. Ratio of length of oviscape to length of tergum V 1.63:1. Apex of piercer broadly rounded with 2 very short subapical bristles (Fig. 435). Spicules at distal end of middle segment with 1 very long and broad central dentation and 1 or 2 smaller lateral dentations (Fig. 436).

ATTRACTANT: Cue lure.

COMMENTS

D. aequalis is distinct from all other South Pacific *Didacus* in having the medial postsutural vitta absent and possessing a broad fuscous triangle on dorsal surface of scutellum and a broad costal band confluent with M for its entire length. In the original description, Coquillett listed the material studied as follows — “Tuggerah Lakes, near Gosford, New South Wales. Specimens of each sex collected by Inspector Hunter, June 25, 1907; bred from larvae in oranges”. I have studied 2 specimens in NMNH. Because there does not appear to be a valid holotype designation (see comments for *B. facialis*), I designate the female labelled “Type No.11944 USNM” as lectotype and the male as paralectotype. One specimen in NSW may be a type but this is not certain. The host record must be regarded as doubtful as it has never been confirmed by subsequent recordings from any commercial fruits. W.W. Froggatt previously confused specimens reared from hosts (Drew, 1974a: 64–65).

Dacus (Didacus) dissimilis, n. sp. (Fig. 437)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Oomsis Forestry Reserve, Lae–Bulolo road, attracted to cue lure, 22.vi.1980, R.A.I. Drew and D. Currey.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂ (cue lure), Oomsis Forestry Reserve, Lae–Bulolo road, 22.vi.1980, R.A.I. Drew and D. Currey; 1 ♂ (cue lure), Bubia, May–June 1971, J. Maiyel; 1 ♂ (Willison’s lure), August 1971, J. Maiyel. Central Province: 1 ♂ (cue lure), Ninoa Estate, Sogeri Plateau, 28.ix–5.x.1973, Entomology Staff. Northern Province: 6 ♂♂, 4.x.1972, 2 ♂♂, 1.xi.1972, Pirive, Kokoda, E.S.C. Smith.

LOCATION OF TYPES: Holotype (T.10463) and 1 paratype

(T.10464) in QM; 2 paratypes in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 7 paratypes in DPI.

DISTRIBUTION

Known from the Morobe, Central and Northern Provinces, Papua New Guinea.

DIAGNOSIS

Medium sized species; face fulvous with small oval black spots; humeral and notopleural calli yellow; mesonotum red-brown with a mottled appearance, a broad triangular medial longitudinal postsutural vitta present, lateral postsutural vittae absent, mesopleural stripe of medium width (reaching midway between anterior npl. bristle and anterior margin of notopleural callus), a triangular yellow marking along anterior margin of mesonotal suture, scutellum yellow; wing with a broad dark fuscous costal band and anal streak, costal cells fuscous with microtrichia covering both cells; abdominal terga III–V orange-brown with broad medial and lateral longitudinal dull black bands over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.83 mm. Frons narrowing slightly posteriorly, length 1.32 times breadth; fulvous with no dark markings; anteromedial hump covered by a small number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fulvous. Ocellar triangle fuscous. Vertex fulvous. Face fulvous with small elongate-oval, black facial spots not reaching epistoma; length of face 0.6 mm. Genae fulvous, large fuscous subocular spot present; fuscous bristle present. Occiput fulvous, yellow along eye margins; occipital row with 1–4 well developed black bristles and a large number of smaller pale bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous except fuscous on apex and outer surface; a pale dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.35 mm; 1.13 mm.

Thorax mesonotum red-brown with a mottled appearance resulting from sites of attachment of the dorsoventral flight muscles. Pleural areas pale fuscous except red-brown below humeral calli. Yellow markings as follows: humeral calli; notopleural calli; mesopleural stripe of medium width reaching midway between anterior npl. bristle and anterior margin of notopleural callus dorsally, continuing to steropleuron as a transverse spot, anterior margin slightly convex; a triangular marking along anterior margin of each mesonotal suture, with base at notopleural callus and apex at inner margin of suture; a broad triangular

medial longitudinal postsutural vitta from level of upper pa. bristles to level of mesonotal suture; upper hypopleural calli (posterior apices fuscous); anterior $\frac{2}{3}$ lower hypopleural calli (remainder fuscous). Lateral postsutural vittae absent. Postnotum pale fuscous. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 2 (inner pair absent and in 1 specimen there are 2 outer scp. on 1 side); all bristles well developed and black.

Legs fore coxae red-brown to fuscous, mid and hind coxae pale fuscous; all femora orange-brown tending pale fuscous on apical $\frac{1}{3}$ of hind femora; fore and hind tibiae pale fuscous, mid tibiae orange-brown; all tarsi fulvous; mid tibiae each with an apical black spur; fore femora with a row of long dark setae on dorsal surface.

Wings length 6.6 mm; costal cells fuscous, dense microtrichia covering both costal cells; remainder of wings colourless except for dark fuscous subcostal cell, broad dark fuscous costal band confluent with R_{4+5} and overlapping this vein towards apex of wing, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval, terga fused; pecten present on tergum III. Tergum I wider than long; sterna I and II slightly longer than wide. Tergum I dark fuscous; terga II–V orange-brown except for a broad medial longitudinal band which is dark fuscous on tergum II and black on terga III–V, fuscous around anterior and lateral margins of tergum II, broad lateral longitudinal dark fuscous to dull black bands over terga III–V. A pair of oval shining spots on tergum V. Posterior lobe of surstylus of medium length, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure; Willison's lure.

COMMENTS

D. dissimilis is similar to *D. maprikensis* in possessing a broad costal band confluent with R_{4+5} but differs from this species in having the abdomen uniformly orange-brown, the mesopleural stripe extending to the anterior npl. bristle above, and the entire wing membrane with a pale fuscous tint.

***Dacus (Didacus) hardyi* Drew**
(Figs 438–440)

Dacus (Didacus) hardyi Drew, 1979: 74–6.

MATERIAL EXAMINED

A series of specimens (including paratypes) in DPI (see DISTRIBUTION).

LOCATION OF TYPE: Holotype ♂ (T.7788) in QM.

DISTRIBUTION

PREVIOUSLY RECORDED: The coastal areas of the Northern Territory (type locality, Fogg Dam).

NEW RECORDS: Torres Strait islands: Darnley, Stephens, Yorke (records from Plant Quarantine Survey).

DIAGNOSIS

Small species; large oval black facial spots; humeral and notopleural calli yellow; mesonotum red-brown without dark markings, mesopleural stripe reaching midway between anterior margin of notopleural callus and anterior npl. bristle, lateral postsutural vittae absent, a transverse rectangular yellow marking across posterior region of mesonotum, broad yellow triangle above notopleural calli and running along anterior margin of mesonotal suture, scutellum yellow; wing with a narrow dark fuscous costal band and narrow fuscous anal streak, costal cells fuscous, microtrichia covering second costal cell and outer $\frac{1}{2}$ of first costal cell; abdominal terga III–V orange-brown darkening to red-brown laterally and with a narrow intermittent medial longitudinal fuscous band over all 5 terga.

DESCRIPTION

FEMALE: Ovipositor apex of piercer rounded at tip with 2 pairs of very short subapical bristles (Fig. 439). Spicules at distal end of middle segment with 1 large central dentation and 2 or 3 smaller lateral dentations (Fig. 440).

ATTRACTANT: Cue lure.

COMMENTS

D. hardyi was described adequately by Drew (1979). It is similar to *D. palmerensis* in possessing a narrow costal band not reaching R_{4+5} but differs from this species in the shape of the medial postsutural vitta.

***Dacus (Didacus) maprikensis*, n. sp.**
(Fig. 441)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, East Sepik Province: Maprik, Oct.–Dec. 1957, Malaria Control Section.

Paratypes, PAPUA NEW GUINEA, East Sepik Province: 2 ♂♂, Maprik, Oct.–Dec. 1957, Malaria Control Section.

LOCATION OF TYPES: Holotype (T.10465) in QM; 1 paratype in ANIC; 1 paratype in DPI.

DISTRIBUTION

Known only from Maprik, Papua New Guinea.

DIAGNOSIS

Medium sized species; face with a pair of very small oval pale fuscous spots; humeral and notopleural calli yellow; mesonotum red-brown, lateral postsutural vittae absent, medial postsutural vitta present, mesopleural stripe of medium width (reaching midway between anterior margin of notopleural callus and anterior npl. bristle), yellow triangle extending from notopleural callus along anterior margin of mesonotal suture, scutellum yellow; wing with a pale fuscous tint, broad fuscous costal band and anal streak, costal cells fuscous and covered with dense microtrichia; all abdominal terga uniformly orange-brown.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.8 mm. Frons narrowing slightly posteriorly, length 1.43 times breadth; fulvous with, at most, pale fuscous around some orbital bristles and on anteromedial hump; latter covered by a small number of short dark setae; orbital bristles black: 1 s.or., 2 i.or. (in some specimens 1 pair of i.or. are reduced in size); lunule fulvous. Ocellar triangle black. Vertex fulvous. Face fulvous with small pale fuscous oval spots; length of face 0.58 mm. Genae fulvous, very pale brown subocular spot present; red-brown bristle present. Occiput fulvous, yellow along eye margins; occipital row with 2–5 dark bristles. Antennae with segments 1 and 2 fulvous, segment 3 fulvous with fuscous on apex and outer surface; a red-brown dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.25 mm; 0.38 mm; 1.10 mm.

Thorax mesonotum red-brown with a mottled appearance due to sites of attachment of dorsoventral flight muscles. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; a triangle extending along anterior margin of mesonotal suture from notopleural callus; mesopleural stripe of medium width, extending midway between anterior margin of notopleural callus and anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; upper hypopleural calli (posterior apices red-brown); anterior $\frac{2}{3}$ lower hypopleural calli (remainder red-brown); a medial longitudinal postsutural vitta broadly rounded posteriorly and narrowing to a point anteriorly to end at the level of the mesonotal suture. Lateral postsutural vittae absent. Postnotum red-brown. Scutellum yellow with a

narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 2; all bristles well developed and black.

Legs all segments entirely fulvous without dark markings; mid tibiae each with an apical black spur; fore femora with long pale setae on dorsal and ventral surfaces.

Wings length 6.9 mm; costal cells fuscous, dense microtrichia covering both costal cells; remainder of wings with a pale fuscous tint except for a fuscous subcostal cell, a broad fuscous costal band confluent with R_{2+3} and overlapping this vein at its extremity, a broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga fused; pecten present on tergum III. Tergum I and sterna I and II wider than long. All terga uniformly orange-brown without dark markings. A pair of oval orange-brown shining spots on tergum V. Posterior lobe of surstylus long, sternum V with posterior margin straight.

ATTRACTANT: No known record.

COMMENTS

D. maprikensis is similar to *D. dissimilis* in possessing the costal band confluent with R_{4+5} for its entire length but differs in having the abdominal terga uniformly orange-brown, mesopleural stripe extending to the anterior npl. bristle and the entire wing membrane covered in a pale fuscous tint.

Dacus (Didacus) palmerensis, n. sp. (Fig. 442)

TYPE SPECIMEN

Holotype ♂, AUSTRALIA, north Queensland: Cape York Peninsula, Palmer River, attracted to cue lure, 1.xi.1978, I. Titmarsh.

LOCATION OF TYPE: Holotype (T.10466) in QM.

DISTRIBUTION

Known only from Palmer River, Queensland.

DIAGNOSIS

Small pale coloured species; medium sized elongate-oval facial spots present; humeral and notopleural calli yellow; mesonotum red-brown, lateral postsutural vittae absent, a broad triangular medial postsutural vitta present, broad mesopleural stripe reaching almost to anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells pale fuscous, microtrichia covering both costal cells; abdominal terga III–V fulvous except for 2

broad lateral longitudinal red-brown bands and a narrow medial longitudinal red-brown to dark fuscous band over all 3 terga.

DESCRIPTION

MALE: Head generally fulvous. Vertical length 1.4 mm. Frons of even width, length 1.55 times breadth; fulvous with fuscous around orbital bristles and on anteromedial hump, latter covered by a large number of short pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule pale fuscous. Ocellar triangle fulvous. Vertex fulvous. Face fulvous with medium sized elongate-oval black spots present; length of face 0.4 mm. Genae fulvous, fuscous subocular spot present; black bristles present. Occiput fulvous, yellow along eye margins; occipital row with 2–3 well developed red-brown bristles. Antennae with segments 1 and 2 fulvous, segment 3 missing; a weak fulvous dorsal bristle on segment 2; length of segments: 0.20 mm; 0.30 mm.

Thorax mesonotum red-brown with a mottled appearance resulting from attachment of dorsoventral flight muscles. Pleural areas red-brown without dark markings. Yellow markings as follows: humeral calli; notopleural calli; moderately broad mesopleural stripe extending almost to anterior npl. bristle dorsally, continuing to sternopleuron as a transverse spot, anterior margin straight; a triangular marking along anterior margin of each mesonotal suture, with base at notopleural callus and apex at inner margin of each suture; a medial longitudinal vitta in the shape of a broad triangular marking; upper hypopleural calli (posterior apices red-brown); anterior $\frac{3}{4}$ lower hypopleural calli (remainder red-brown). Lateral postsutural vittae absent. Postnotum red-brown. Scutellum yellow except for narrow red-brown basal band. Bristles: sc. 2; prsc. absent; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles weak and dark fuscous.

Legs fore coxae fulvous, mid and hind coxae red-brown; all other segments fulvous except apices of hind femora pale fuscous; mid tibiae each with an apical black spur.

Wings length 5.1 mm; costal cells pale fuscous, microtrichia covering both costal cells; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate-oval; terga fused; pecten present on tergum III. Tergum I and sterna I and

II wider than long. Terga I and II red-brown except for 2 large transverse fulvous markings on posterior margin of tergum II and a medial longitudinal vitta which is dark red-brown on posterior ½ of tergum I and pale fuscous on tergum II; terga III–V fulvous except for 2 broad lateral longitudinal red-brown bands and a narrow medial longitudinal band which is dark red-brown to pale fuscous on tergum III, fuscous on tergum IV and dark fuscous on tergum V. A pair of oval fulvous shining spots on tergum V. Posterior lobe of surstylus long, sternum V with a slight concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. palmerensis is similar to *D. hardyi* Drew in having a narrow costal band not reaching R_{4+5} but differs in possessing a medial postsutural vitta in the shape of a broad triangular yellow marking.

KEY TO SPECIES OF SUBGENUS *DIDACUS*

1. Lateral and medial postsutural vittae absent; scutellum yellow with a broad fuscous triangle on dorsal surface; costal band confluent with M for its entire length *aequalis*
Lateral postsutural vittae absent; medial postsutural vitta present; scutellum entirely yellow; costal band not attaining M 2
- 2(1). Costal band confluent with R_{4+5} for its entire length 3
Costal band narrow, not attaining R_{4+5} except at apex of wing 4
- 3(2). Abdominal terga uniformly orange-brown; mesopleural stripe extending to anterior npl. bristle; entire wing membrane with pale fuscous tint *maprikensis*
Abdominal terga III–V with a black medial and broad dark fuscous to black lateral longitudinal bands; mesopleural stripe reaching midway between anterior margin of notopleural calli and anterior npl. bristles; wing membrane clear
..... *dissimilis*
- 4(2). Medial postsutural vitta as a transverse rectangular marking across posterior region of mesonotum *hardyi*
Medial postsutural vitta as a broad triangular marking *palmerensis*

Semicallantra, n. subgen.

Dacus (Semicallantra) aquilus, n. sp. (Fig. 443)

TYPE SPECIMENS

Holotype ♂, PAPUA NEW GUINEA, Morobe Province: Mt Kaindi (1200 m), 11.vi.1981, A. Allison.

Paratypes, PAPUA NEW GUINEA, Morobe Province: 1 ♂, Mt Missim, 12.ii.1981; 4 ♂♂, Mt Missim (950 m), 20.viii.1981; 1 ♂, Mt Missim (950 m), 28.v.1981; 1 ♂, Wau Ecology Institute, 28.xii.1981. All collected at cue lure by A. Allison.

LOCATION OF TYPES: Holotype (T.10467) in QM; 1 paratype in ANIC; 1 paratype in BMNH; 1 paratype in DPI(PNG); 4 paratypes in DPI.

DISTRIBUTION

Known only from Mt Missim and Mt Kaindi, Papua New Guinea.

DIAGNOSIS

Medium sized species; facial spots very large elongate-oval; humeral calli yellow (anterior and ventral margins dark fuscous); notopleural calli yellow (basal ½ black); mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe of medium width reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and broad fuscous anal streak, costal cells with a very pale fulvous tint, microtrichia covering outer ½ of second costal cell only; abdominal terga I–V black with a narrow dark fuscous pattern across posterior margin of tergum V and extending anteriorly along either side of a narrow medial longitudinal black band.

DESCRIPTION

MALE: Head generally red-brown. Vertical length 1.65 mm. Frons of even width, length 1.48 times breadth; red-brown with fuscous around s.or. bristles and on anteromedial hump, latter covered by a large number of small pale setae; orbital bristles black: 1 s.or., 2 i.or.; lunule red-brown. Ocellar triangle black. Vertex fuscous. Face red-brown with very large elongate-oval black spots filling antennal furrows; length of face 0.53 mm. Genae red-brown, black subocular spot present; black bristle present. Occiput black, red-brown along eye margins; occipital row with 3–6 well developed black bristles. Antennae with segments 1 and 2 red-brown, segment 3 fuscous except red-brown along ventral margin; a strong black dorsal bristle on segment 2; arista black (red-brown basally); length of segments: 0.30 mm; 0.50 mm; 0.93 mm.

Thorax mesonotum and pleural areas black with no pale markings. Yellow markings as follows: humeral calli (anterior and ventral margins dark fuscous); apical $\frac{1}{2}$ of notopleural calli (basal $\frac{1}{2}$ black); medium sized mesopleural stripe reaching anterior npl. bristle dorsally, not reaching sternopleuron below, anterior margin straight; upper hypopleural calli (dorsal margin and posterior apices black); anterior $\frac{5}{9}$ lower hypopleural calli (remainder including broad ventral margin black); 2 broad parallel sided lateral postsutural vittae ending behind upper pa. bristles. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs all coxae dark fuscous; all femora black; fore and mid tibiae fuscous, hind tibiae dark fuscous; all tarsal segments fulvous; rows of long black setae on dorsal surfaces of fore femora; mid tibiae each with an apical black spur.

Wings length 6.4 mm; costal cells with a very pale fulvous tint, microtrichia covering outer $\frac{1}{2}$ of second costal cell only; remainder of wings colourless except fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending just beyond extremity of R_{4+5} , broad fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I wider than long; sterna I and II as long as wide. Terga I–V black except for a narrow dark fuscous band along posterior margin of tergum V and extending anteriorly along either side of a narrow medial longitudinal black band on this tergum. A pair of oval black shining spots on tergum V. Posterior lobe of surstylus of medium development, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Cue lure.

COMMENTS

D. aquilus is similar to *D. nigriculus* in having lateral postsutural vittae present and the medial postsutural vitta absent but differs in possessing humeral calli yellow (except anterior $\frac{1}{4}$ dark fuscous), notopleural calli with apical $\frac{1}{2}$ yellow (basal $\frac{1}{2}$ black) and wing membrane colourless.

***Dacus (Semicallantra) memnonius*, n. sp.**
(Fig. 444)

TYPE SPECIMEN

Holotype σ , PAPUA NEW GUINEA, Central District:

Hombrom Bluff, attracted to methyl eugenol, 24.xi.1973, J. Stibick.

LOCATION OF TYPE: Holotype (T.10468) in QM.

DISTRIBUTION

Known only from Hombrom Bluff, Papua New Guinea.

DIAGNOSIS

Medium sized species; face dark fuscous with large elongate black spots; humeral calli black; notopleural calli yellow dorsally (black ventrally); mesonotum black, lateral and medial postsutural vittae absent, mesopleural stripe broad reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells with pale fuscous tint, microtrichia in outer $\frac{1}{2}$ second costal cell only; all abdominal terga black except for a narrow fulvous band along posterior margin of tergum V.

DESCRIPTION

MALE: Head generally pale fuscous. Vertical length 1.78 mm. Frons narrowing slightly posteriorly, length 1.43 times breadth; pale fuscous with dark fuscous to black on anterior $\frac{1}{3}$; anteromedial hump covered by a small number of short dark setae; orbital bristles black; 1 s.or., 2 i.or. (1 posterior i.or. bristle absent); lunule fulvous. Ocellar triangle black. Vertex fuscous. Face dark fuscous with large elongate black facial spots, running along antennal furrows from antennal sockets to end just before epistoma; length of face 0.58 mm. Genae fuscous, small black subocular spot present; black bristle present. Occiput black laterally, fuscous centrally and along eye margins; occipital row with a large number of well developed black bristles. Antennae with segment 1 fulvous, segment 2 fuscous, segment 3 dark fuscous; a black dorsal bristle on segment 2; arista black (fulvous basally); length of segments: 0.33 mm; 0.51 mm; 0.98 mm.

Thorax mesonotum and pleural areas black. Yellow markings as follows: dorsal $\frac{1}{2}$ of notopleural calli (remainder black); broad mesopleural stripe reaching anterior npl. bristle dorsally, narrowing sharply ventrally, anterior margin straight; upper hypopleural calli (posterior apices black); anterodorsal spot on lower hypopleural calli (remainder black). Lateral and medial postsutural vittae absent. Humeral calli black dorsally, dark fuscous ventrally. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 4; all bristles well developed and black.

Legs coxae dark fuscous; femora black; tibiae dark fuscous; tarsi fulvous; mid tibiae each with an apical black spur; fore femora with rows of long black setae on dorsal and ventral surfaces.

Wings length 6.7 mm; costal cells with pale fuscous tint, microtrichia in outer $\frac{1}{2}$ of second costal cell; remainder of wings colourless except for fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and ending between extremities of R_{4+5} and M, narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe weak.

Abdomen elongate, clavate and petiolate, terga fused but with overlap along sutures (except between terga I and II); pecten present on tergum III; tergum I long and narrow; sterna I and II longer than wide. All terga black except for a narrow transverse fulvous band along posterior margin of tergum V. A pair of oval shining spots on tergum V. Posterior lobe of surstylus of medium length, sternum V with a deep concavity on posterior margin.

ATTRACTANT: Methyl eugenol.

COMMENTS

D. memnonius differs from the other species of South Pacific *Semicallantia* in having lateral and medial postsutural vittae absent.

Dacus (Semicallantia) nigriculus, n. sp. (Fig. 445)

TYPE SPECIMEN

Holotype σ , PAPUA NEW GUINEA, Morobe Province: Robbies Creek, Stony logging area, Bulolo, collected under leaf of *Musa* sp., 29.vi.1979, H. Roberts.

LOCATION OF TYPE: Holotype (T.10469) in QM.

DISTRIBUTION

Known only from the Bulolo area, Papua New Guinea.

DIAGNOSIS

Medium sized species; face dark fulvous with very large black spots covering antennal furrows; humeral calli dark fuscous; notopleural calli yellow; mesonotum black, lateral postsutural vittae present, medial postsutural vitta absent, mesopleural stripe broad reaching anterior npl. bristle, scutellum yellow; wing with a narrow fuscous costal band and anal streak, costal cells with a pale fuscous tint, microtrichia in outer $\frac{1}{2}$ of second costal cell only; abdomen black except dark fuscous on posterior of tergum V.

DESCRIPTION

MALE: Head generally dark fulvous. Vertical length 1.68 mm. Frons narrowing slightly posteriorly, length 1.37 times breadth; dark fulvous except fuscous around orbital bristles and on anteromedial hump; latter covered by small dark setae; orbital bristles black: 1 s.or., 2 i.or.; lunule fuscous. Ocellar triangle black. Vertex fuscous. Face dark fulvous with very large elongate black spots covering the antennal furrows; length of face 0.53 mm. Genae dark fulvous, large dark fuscous subocular spot present; black bristle present. Occiput dark fuscous, dark fulvous along eye margins; occipital row with 6–7 well developed black bristles. Antennae with segment 1 fulvous basally, fuscous apically, segment 2 fuscous, segment 3 dark fuscous; a small black dorsal bristle on segment 2; arista black (dark fulvous basally); length of segments: 0.30 mm; 0.43 mm; 0.95 mm.

Thorax mesonotum and pleural areas black. Yellow markings as follows: notopleural calli; mesopleural stripe broad, reaching anterior npl. bristle dorsally, not continuing to sternopleuron, anterior margin straight; 2 lateral postsutural vittae, narrowing anteriorly and broadly rounded posteriorly to end behind the upper pa. bristles; upper hypopleural calli (posterior apices black); anterior $3/5$ lower hypopleural calli (remainder including broad ventral margin black). Humeral calli dark fuscous. Postnotum black. Scutellum yellow except for narrow black basal band. Bristles: sc. 2; prsc. 2; pa. 2; sa. absent; mpl. 1; npl. 2; scp. 6; all bristles well developed and black.

Legs all coxae dark fuscous; fore femora dark fuscous, mid and hind femora black; fore and mid tibiae dark fuscous, hind tibiae black; all tarsal segments fulvous; mid tibiae each with an apical black spur; fore femora with a row of long dark setae on dorsal surface.

Wings length 6.4 mm; costal cells with pale fuscous tint, microtrichia in outer $\frac{1}{2}$ of second costal cell only; remainder of wings with a pale fuscous tint, dark fuscous subcostal cell, narrow fuscous costal band overlapping R_{2+3} and lacking a distinct margin between R_{2+3} and R_{4+5} , a narrow fuscous anal streak ending at wing margin; dense aggregation of microtrichia around $A_1 + CuA_2$; supernumerary lobe of medium development.

Abdomen elongate-oval; terga free; pecten present on tergum III. Tergum I wider than long; sterna I and II slightly longer than wide. Terga I–IV black; tergum V black along anterior margin, remainder dark fuscous. A pair of oval shining spots on tergum V. Posterior lobe of surstylus

short, sternum V with a deep concavity on posterior margin.

ATTRACTANT: No known record.

COMMENTS

D. nigriscus is similar to *D. aquilus* in having lateral postsutural vittae present and the medial postsutural vitta absent but differs in possessing humeral calli dark fuscous, notopleural calli entirely yellow and wing membrane with a pale fuscous tint.

KEY TO SPECIES OF SUBGENUS *SEMICALLANTRA*

1. Lateral and medial postsutural vittae absent *memnonius*
Lateral postsutural vittae present; medial postsutural vitta absent2
- 2(1). Humeral calli dark fuscous; notopleural calli entirely yellow; wing membrane with pale fuscous tint*nigriscus*
Humeral calli yellow except anterior ¼ dark fuscous; notopleural calli with apical ½ yellow and basal ½ black; wing membrane colourless*aquilus*

Genus **Paracallantra** Hendel

Paracallantra vespiformis Hendel

Paracallantra vespiformis Hendel, 1927b: 60-1; Drew, 1972a: 20; Drew, 1974a: 98.

Dacus (*Paracallantra*) *vespiformis*: Hardy, 1955b: 434.

MATERIAL EXAMINED

None.

LOCATION OF TYPE: The holotype ♂ was placed in the Hamburg Museum, Germany and lost when this Museum was destroyed by fire in 1943.

DISTRIBUTION

New Britain (type locality).

ATTRACTANT: No known record.

COMMENTS

The definition of this species is unclear. *Dacus* (*Callantra*) *axanus* (Hering) is common in New Britain and I believe it possible that Hendel had a specimen of this species which he described as *Paracallantra vespiformis*.

BIOLOGY

In this section the biology of the subfamily Dacinae is discussed and particularly aspects which may influence species distribution and speciation.

HOST PLANTS

In Table 1 host records are presented for fruit fly species within Australasia and Oceania. Consequently, only a small number of hosts are given for the introduced *B. cucurbitae* which infests a wide range of plants in South East Asia. Fruit fly species are listed in alphabetical order within subgenera of the genera *Bactrocera* and *Dacus*. The hosts have been compiled from those of May (1953, 1957a, 1960), Allwood and Angeles (1979), Drew (1978, 1982) and new records from recent field work. It was necessary to revise published records in order to update the botanical taxonomy and amend errors in plant and fruit fly identifications. A complete host list for fruit flies in the Northern Territory is to be published separately (Smith et al., in press).

Some fruits previously reported as hosts of *B. tryoni*, viz. strawberries, grapes and lemons, are rarely infested. Additionally, oviposition is common in avocados and passionfruit although larval development is rare. *B. bryoniae* has been reared from commercial fruits only in Papua New Guinea.

Some species have been classified as having minor pest status on the basis of single or rare occurrences (May, 1963). These records have not been confirmed subsequently and the following fly species are therefore not considered to have any economic importance: *B. breviaculeus*, *B. cacuminata*, *B. halfordiae*, *B. mayi*, *B. mutabilis* and *D. aequalis*. The record of *D. aequalis* is almost certainly in error (see discussion under comments on that species). *B. breviaculeus*, *B. halfordiae*, *B. mayi* and *B. mutabilis* are of general red-brown colouration and teneral host reared specimens would look superficially like *B. tryoni*. Therefore, previous records upon which these species were considered economic may have been based on incorrect identifications.

May (1953) recorded *Zeugodacus synnephes* (Hendel) in *Bryonopsis laciniosa*. Neither the fly nor the plant occur in Australia and the association most likely was of *B. chorista* in *Diplocyclos palmatus*.

Table 1. Host records of fruit flies occurring in the Australasian and Oceanian regions.

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Afrodacus) jarvisi</i>	Anacardiaceae	<i>Semecarpus australiensis</i>	<i>Mangifera indica</i> (mango)	
	Barringtoniaceae	<i>Planchonia careya</i>		
	Chrysobalanaceae	<i>Parinari corymbosum</i>		
	Combretaceae	<i>Terminalia catappa</i> ; <i>Terminalia melanocarpa</i>		
	Ebenaceae		<i>Diospyros kaki</i> (persimmon)	
	Meliaceae	<i>Aglaia sapindina</i>		
	Musaceae		<i>Musa</i> sp. (banana)	
	Myrtaceae	<i>Syzygium armstrongii</i> ; <i>Syzygium cormiflorum</i> ; <i>Syzygium rubiginosum</i> ; <i>Syzygium rubrimolle</i> ; <i>Syzygium suborbiculare</i>	<i>Psidium cattleianum</i> (cherry guava); <i>Psidium guajava</i> (guava)	
	Oleaceae	<i>Notalaea</i> sp.		
	Punicaceae		<i>Punica granatum</i> (pomegranate)	
	Rosaceae		<i>Cydonia oblonga</i> (quince); <i>Prunus armeniaca</i> (apricot); <i>Prunus persica</i> (peach); <i>Pyrus communis</i> (pear)	
	Sapotaceae	<i>Planchonella</i> sp.		
<i>B. (Austrodacus) cucumis</i>	Caricaceae		<i>Carica papaya</i> (papaya)	
	Cucurbitaceae	<i>Diplocyclos palmatus</i> ; <i>Momordica charantia</i>	<i>Cucumis melo</i> (rockmelon); <i>Cucumis sativus</i> (cucumber); <i>Cucurbita pepo</i> (marrow, pumpkin, squash);	

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Austrodacus) cucumis</i> (continued)			<i>Luffa cylindrica</i> (vegetable sponge); <i>Trichosanthes anguina</i> (guada bean)	
	Euphorbiaceae	<i>Glochidion harveyanum</i>		
	Solanaceae		<i>Lycopersicon lycopersicum</i> (tomato)	
<i>B. (Bactrocera) alyxiae</i>	Apocynaceae	<i>Alyxia spicata</i>		
<i>B. (Bactrocera) aquilonis</i>	Arecaceae (Palmae)	<i>Livistona humilis</i>		
	Chrysobalanaceae	<i>Maranthes corymbosa</i>		
	Combretaceae	<i>Terminalia erythrocarpa</i> ; <i>Terminalia ferdinandiana</i> ; <i>Terminalia grandiflora</i>		
	Elaeocarpaceae	<i>Elaeocarpus grandis</i>		
	Meliaceae	<i>Aglaia eleagnoidea</i>		
	Myrtaceae	<i>Acmena hemilampra</i> ; <i>Cleistocalyx operculatus</i> ; <i>Syzygium armstrongii</i> ; <i>Syzygium claviflorum</i> ; <i>Syzygium forte</i> ; <i>Syzygium operculatum</i> ; <i>Syzygium suborbiculare</i>	<i>Psidium guajava</i> (guava)	
	Rosaceae		<i>Prunus persica</i> (peach)	
	Rutaceae	<i>Glycosmis pentaphylla</i> ; <i>Glycosmis trifoliata</i> ; <i>Micromelem minutum</i>	<i>Citrus paradisi</i> (grapefruit); <i>Citrus</i> sp.	
<i>B. (Bactrocera) bancroftii</i>	Moraceae	<i>Cudrania cochinchinensis</i>		
<i>B. (Bactrocera) barringtoniae</i>	Barringtoniaceae	<i>Barringtonia calyptrata</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
	Guttiferae	<i>Garcinia warrenii</i>		
<i>B. (Bactrocera) breviaculeus</i>	Euphorbiaceae	<i>Glochidion ferdinandii</i> ; <i>Glochidion harveyanum</i>		
<i>B. (Bactrocera) bryoniae</i>	Cucurbitaceae	<i>Diplocyclos palmatus</i> ; <i>Mukia maderaspatana</i> ; <i>Zehneria cunninghamii</i>		
	Musaceae		<i>Musa</i> sp. (banana)	
	Passifloraceae	<i>Passiflora foetida</i> ; <i>Passiflora suberosa</i>		
	Solanaceae		<i>Capsicum frutescens</i> (capsicum)	
	Strychnaceae	<i>Strychnos lucida</i>		
<i>B. (Bactrocera) bullata</i>	Guttiferae	<i>Garcinia</i> sp.		
<i>B. (Bactrocera) cacuminata</i>	Elaeocarpaceae	<i>Elaeocarpus</i> sp.		
	Meliaceae	<i>Disoxylum</i> sp.		
	Solanaceae	<i>Solanum erianthum</i> ; <i>Solanum mauritianum</i>		
<i>B. (Bactrocera) curvipennis</i>	Rutaceae		<i>Citrus</i> sp.	
<i>B. (Bactrocera) dapsiles</i>	Solanaceae	<i>Solanum mauritianum</i>		
<i>B. (Bactrocera) diospyri</i>	Ebenaceae	<i>Diospyros maritima</i>		
<i>B. (Bactrocera) distincta</i>	Sapotaceae	<i>Burckella richii</i>	<i>Chrysophyllum cainito</i> (star apple)	
<i>B. (Bactrocera) endiandrae</i>	Annonaceae	<i>Cananga odorata</i>		
	Chrysobalanaceae	<i>Maranthes corymbosa</i>		
	Lauraceae	<i>Beilschmiedia obtusifolia</i> ; <i>Cryptocarya erythroxylon</i> ; <i>Litsea</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
		<i>leefeana</i> ; <i>Endiandra</i> <i>cowleyana</i> ; <i>Endiandra</i> <i>discolor</i> ; <i>Endiandra</i> <i>muelleri</i>		
<i>B. (Bactrocera) eximia</i>	Combretaceae	<i>Terminalia brassii</i> (ex stem)		
<i>B. (Bactrocera) facialis</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	
	Myrtaceae		<i>Psidium guajava</i> (guava)	
	Rosaceae		<i>Prunus persica</i> (peach)	
	Rutaceae		<i>Citrus</i> sp.	
	Solanaceae		<i>Capsicum frutescens</i> (capsicum); <i>Lycopersicon lycopersicum</i> (tomato)	
<i>B. (Bactrocera) fagraea</i>	Myrtaceae	<i>Syzygium</i> sp. (nr. <i>suborbiculare</i>)		
	Potaliaceae	<i>Fagraea gracilipes</i>		
<i>B. (Bactrocera) frauenfeldi</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	
	Combretaceae	<i>Terminalia catappa</i>		
	Moraceae		<i>Artocarpus altilis</i> (breadfruit)	
	Myrtaceae	<i>Syzygium branderhorstii</i> ; <i>Syzygium malaccense</i>	<i>Psidium guajava</i> (guava)	
	Sapotaceae	<i>Manilkara kauki</i>		
<i>B. (Bactrocera) halfordiae</i>	Annonaceae	<i>Rauwenhoffia leichhardtii</i>		
	Cunoniaceae	<i>Schizomeria ovata</i>		
	Moraceae	<i>Ficus racemosa</i>		
	Myrtaceae	<i>Syzygium corynanthum</i> ; <i>Syzygium crebrinerve</i>		<i>Syzygium uniflora</i> (brazilian cherry);

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Bactrocera) halfordiae</i> (continued)				<i>Feijoa sellowiana</i> (feijoa)
	Rosaceae		<i>Eriobotrya japonica</i> (loquat)	
	Rutaceae	<i>Acronychia laevis</i> ; <i>Acronychia pubescens</i> ; <i>Halfordia kendack</i>	<i>Citrus paradisi</i> (grapefruit); <i>Citrus reticulata</i> (mandarin); <i>Citrus sinensis</i> (orange); <i>Fortunella japonica</i> (kumquat)	
	Sapotaceae	<i>Niemeyera chartacea</i> ; <i>Planchonella australis</i>		
	Smilacaceae	<i>Smilax australis</i>		
	Thymelaeaceae	<i>Phaleria chermsideana</i>		
<i>B. (Bactrocera) kirki</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	
	Combretaceae	<i>Terminalia catappa</i>		
	Myrtaceae		<i>Psidium guajava</i> (guava)	
	Rosaceae		<i>Prunus persica</i> (peach)	
	Solanaceae		<i>Capsicum frutescens</i> (capsicum)	
<i>B. (Bactrocera) kraussi</i>	Annonaceae	<i>Cananga odorata</i>		
	Apocynaceae			<i>Thevetia peruviana</i> (yellow oleander)
	Cunoniaceae	<i>Schizomeria whitei</i>		
	Euphorbiaceae	<i>Fontainea picrosperma</i>		
	Flacourtiaceae	<i>Baileoxylon lanceolatum</i>		
	Icacinaceae	<i>Irvingbaileya australis</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
	Lauraceae	<i>Endiandra compressa</i> ; <i>Endiandra discolor</i> ; <i>Endiandra palmerstonii</i>		
	Myrtaceae	<i>Acmena graveolens</i> ; <i>Rhodomyrtus macrocarpa</i> ; <i>Syzygium australe</i> ; <i>Syzygium branderhorstii</i> ; <i>Syzygium cormiflorum</i> ; <i>Syzygium luehmanni</i> ; <i>Syzygium rubrimolle</i> ; <i>Syzygium suborbiculare</i> ; <i>Syzygium tierneyanum</i>		
	Oleaceae	<i>Notolaea</i> sp.		
	Rutaceae	<i>Acronychia acidula</i> ; <i>Acronychia vestita</i> ; <i>Halfordia scleroxyla</i>		
	Sapindaceae	<i>Arytera</i> sp.; <i>Castanospora alphandii</i>		
	Thymelaeaceae	<i>Phaleria clerodendron</i>		
<i>B. (Bactrocera) laticaudus</i>	Combretaceae	<i>Terminalia muelleri</i>		
	Euphorbiaceae	<i>Glochidion ferdinandii</i>		
	Sapotaceae	<i>Planchonella obovata</i>		
<i>B. (Bactrocera) luteola</i>	Rubiaceae	<i>Guettarda speciosa</i>		
<i>B. (Bactrocera) manskii</i>	Ebenaceae	<i>Diospyros</i> sp.		
	Strychnaceae	<i>Strychnos colubrina</i>		
<i>B. (Bactrocera) mayi</i>	Combretaceae	<i>Terminalia muelleri</i>		
	Rosaceae		<i>Prunus armeniaca</i> (apricot)	

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
	Sapotaceae	<i>Planchonella australis</i> ; <i>Planchonella obovata</i> ; <i>Planchonella pohlmanniana</i>		
<i>B. (Bactrocera) melanotus</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	
	Myrtaceae		<i>Psidium guajava</i> (guava)	
	Rutaceae		<i>Citrus</i> sp.	
<i>B. (Bactrocera) melas</i>	Arecaceae		<i>Phoenix dactylifera</i> (date palm)	
	Moraceae		<i>Ficus carica</i> (fig)	
	Myrtaceae		<i>Psidium guajava</i> (guava)	
	Passifloraceae	<i>Passiflora subpeltata</i>		
	Rosaceae		<i>Eriobotrya japonica</i> (loquat); <i>Malus sylvestris</i> (apple); <i>Prunus domestica</i> (plum); <i>Prunus persica</i> (peach); <i>Pyrus communis</i> (pear)	
	Rutaceae		<i>Citrus paradisi</i> (grapefruit); <i>Citrus sinensis</i> (orange); <i>Fortunella japonica</i> (kumquat)	
<i>B. (Bactrocera) mendosa</i>	Sapotaceae	<i>Pouteria sericea</i>		
<i>B. (Bactrocera) moluccensis</i>	Caesalpiniaceae	<i>Inocarpus fagiferus</i>		
<i>B. (Bactrocera) musae</i>	Capparidaceae	<i>Capparis lucida</i>		
	Caricaceae		<i>Carica papaya</i> (papaya)	
	Musaceae	<i>Musa banksii</i>	<i>Musa acuminata</i> and <i>Musa paradisiaca</i> (commercial banana)	

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
	Myrtaceae	<i>Syzygium bamagense</i>	<i>Psidium guajava</i> (guava)	
<i>B. (Bactrocera) mutabilis</i>	Rutaceae		<i>Fortunella japonica</i> (kumquat)	
<i>B. (Bactrocera) neohumeralis</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	<i>Spondias cytherea</i> (hog plum)
	Annonaceae	<i>Cananga odorata</i>	<i>Annona squamosa</i> (custard apple)	
	Arecaceae (Palmae)		<i>Phoenix dactylifera</i> (date palm)	
	Capparidaceae	<i>Capparis lucida</i>		
	Celastraceae	<i>Cassine australis</i>		
	Combretaceae	<i>Terminalia catappa</i> ; <i>Terminalia melanocarpa</i>		
	Euphorbiaceae	<i>Drypetes australasica</i>		
	Lauraceae	<i>Cryptocarya erythroxylon</i> ; <i>Endiandra compressa</i> ; <i>Endiandra cowleyana</i>		
	Moraceae		<i>Morus nigra</i> (black mulberry)	
	Myrtaceae	<i>Rhodomyrtus macrocarpa</i> ; <i>Syzygium australe</i> ; <i>Syzygium tierneyanum</i>	<i>Psidium cattleianum</i> (cherry guava); <i>Psidium guajava</i> (guava)	<i>Feijoa sellowiana</i> (feijoa); <i>Syzygium uniflora</i> (brazilian cherry)
	Oleaceae	<i>Notalaea</i> sp.		
	Passifloraceae	<i>Passiflora suberosa</i> ; <i>Passiflora subpeltata</i>		
	Naucleaceae	<i>Nauclea orientalis</i>		
	Rosaceae		<i>Eriobotrya japonica</i> (loquat); <i>Fragaria</i> sp. (strawberry);	

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Bactrocera) neohumeralis</i> (continued)			<i>Malus sylvestris</i> (apple); <i>Prunus armeniaca</i> (apricot); <i>Prunus domestica</i> (plum); <i>Prunus persica</i> (peach); <i>Pyrus communis</i> (pear)	
	Rubiaceae		<i>Coffea arabica</i> (coffee)	
	Rutaceae	<i>Casimiroa edulis</i> ; <i>Clausena brevistyla</i>	<i>Citrus maxima</i> (pomelo); <i>Citrus limon</i> (lemon); <i>Citrus paradisi</i> (grapefruit); <i>Citrus reticulata</i> (mandarin); <i>Citrus sinensis</i> (orange); <i>Fortunella japonica</i> (kumquat)	
	Sapindaceae	<i>Ganophyllum falcatum</i>		
	Sapotaceae	<i>Niemeyera chartacea</i> ; <i>Planchonella obovata</i>		
	Solanaceae	<i>Solanum laciniatum</i> ; <i>Solanum seaforthianum</i>	<i>Cyphomandra betacea</i> (tree tomato); <i>Lycopersicon lycopersicum</i> (tomato)	
	Vitaceae		<i>Vitis labruscana</i> (isabella grape)	
<i>B. (Bactrocera) nigrovittata</i>	Lauraceae	<i>Endiandra</i> sp.		
	Solanaceae	<i>Solanum torvum</i>		
<i>B. (Bactrocera) obliqua</i>	Myrtaceae	<i>Syzygium malaccense</i>		
<i>B. (Bactrocera) opiliae</i>	Opiliaceae	<i>Opilia amentacea</i>		
<i>B. (Bactrocera) pallida</i>	Naucleaceae	<i>Nauclea orientalis</i> ; <i>Sarcocephalus coadunatus</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Bactrocera) passiflorae</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	
	Passifloraceae		<i>Passiflora edulis</i> (passionfruit); <i>Passiflora quadrangularis</i> (granadilla)	
	Rutaceae		<i>Citrus</i> sp.	
<i>B. (Bactrocera) phaleriae</i>	Thymelaeaceae	<i>Phaleria blumei</i> var. <i>latifolia</i>		
<i>B. (Bactrocera) psidii</i>	Anacardiaceae		<i>Mangifera indica</i> (mango)	
	Myrtaceae		<i>Psidium cattleianum</i> (cherry guava); <i>Psidium guajava</i> (guava)	
	Passifloraceae		<i>Passiflora quadrangularis</i> (granadilla)	
	Rutaceae		<i>Citrus</i> sp.	
<i>B. (Bactrocera) pulchra</i>	Sapotaceae	<i>Planchonella</i> sp.		
<i>B. (Bactrocera) tenuifascia</i>	Sapotaceae	<i>Planchonella pohlmanniana</i>		
<i>B. (Bactrocera) terminaliae</i>	Combretaceae	<i>Terminalia complanata</i>		
	Lauraceae	<i>Endiandra</i> sp.		
<i>B. (Bactrocera) tinomiscii</i>	Menispermaceae	<i>Chlaenandra ovata</i> ; <i>Tinomiscium phytocrenoides</i>		
	Xanthophyllaceae	<i>Xanthophyllum</i> sp.		
<i>B. (Bactrocera) trivialis</i>	Myrtaceae		<i>Psidium guajava</i> (guava)	
	Rosaceae		<i>Prunus persica</i> (peach)	
	Rutaceae		<i>Citrus paradisi</i> (grapefruit)	
	Solanaceae		<i>Capsicum frutescens</i> (capsicum)	
<i>B. (Bactrocera) tryoni</i>	Anacardiaceae	<i>Pleiogynium timorense</i>	<i>Anacardium occidentale</i> (cashew); <i>Mangifera indica</i> (mango)	<i>Spondias cytherea</i> (hog plum)

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Bactrocera) tryoni</i> (continued)	Annonaceae	<i>Cananga odorata</i> ; <i>Polyalthia nitidissima</i> ; <i>Rauwenhoffia leichhardtii</i>	<i>Annona reticulata</i> (bullock's heart); <i>Annona squamosa</i> (custard apple)	
	Apocynaceae	<i>Alyxia ruscifolia</i> ; <i>Carissa ovata</i> ; <i>Ochrosia elliptica</i>		
	Arecaceae (Palmae)		<i>Phoenix dactylifera</i> (date palm)	
	Cactaceae			<i>Opuntia ficus-indica</i> (indian fig)
	Capparidaceae	<i>Capparis lucida</i> ; <i>Capparis mitchellii</i> ; <i>Capparis nobilis</i>		
	Caricaceae		<i>Carica papaya</i> (papaya)	
	Celastraceae	<i>Cassine australis</i>		
	Combretaceae	<i>Terminalia catappa</i> ; <i>Terminalia melanocarpa</i> ; <i>Terminalia muelleri</i>		
	Cunoniaceae	<i>Schizomeria ovata</i>		
	Davidsoniaceae	<i>Davidsonia pruriens</i>		
	Ebenaceae	<i>Diospyros australis</i>	<i>Diospyros kaki</i> (persimmon)	
	Euphorbiaceae	<i>Drypetes australasica</i> ; <i>Glochidion ferdinandii</i>		
	Flacourtiaceae			<i>Dovyalis caffra</i> (kei apple); <i>Flacourtia jangomas</i>
	Juglandaceae		<i>Juglans regia</i> (walnut)	
	Lauraceae	<i>Beilschmiedia obtusifolia</i> ;	<i>Persea americana</i>	

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
		<i>Cryptocarya erythroxylon</i> ; <i>Endiandra compressa</i> ; <i>Endiandra cowleyana</i> ; <i>Endiandra discolor</i>	(avacado)	
	Meliaceae	<i>Aglaia sapindina</i> ; <i>Owenia venosa</i>		
	Moraceae	<i>Cudrania cochinchinensis</i> ; <i>Ficus macrophylla</i> ; <i>Ficus racemosa</i>	<i>Ficus carica</i> (fig); <i>Morus alba</i> (white mulberry); <i>Morus nigra</i> (black mulberry)	
	Musaceae		<i>Musa acuminata</i> (dwarf banana)	
	Myrtaceae	<i>Acmena graveolens</i> ; <i>Acmena smithii</i> ; <i>Rhodamnia sessiliflora</i> ; <i>Syzygium australe</i> ; <i>Syzygium cormiflorum</i> ; <i>Syzygium corynanthum</i> ; <i>Syzygium kuranda</i> ; <i>Syzygium rubrimolle</i> ; <i>Syzygium suborbiculare</i>	<i>Psidium cattleianum</i> (cherry guava); <i>Psidium guajava</i> (guava)	<i>Feijoa sellowiana</i> (feijoa); <i>Syzygium jambos</i> ; <i>Syzygium uniflora</i> (brazilian cherry)
	Naucleaceae	<i>Nauclea orientalis</i>		
	Oleaceae	<i>Notelaea longifolia</i>	<i>Olea europaea</i> (olive)	
	Oxalidaceae		<i>Averrhoa carambola</i> (carambola)	
	Passifloraceae	<i>Passiflora aurantia</i> ; <i>Passiflora subpeltata</i>	<i>Passiflora edulis</i> (passionfruit); <i>Passiflora quadrangularis</i> (granadilla)	
	Punicaceae		<i>Punica granatum</i> (pomegranate)	
	Rhamnaceae	<i>Rhamnella vitiensis</i> ; <i>Ziziphus mauritiana</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Bactrocera) tryoni</i> (continued)	Rosaceae		<i>Cydonia oblonga</i> (quince); <i>Eriobotrya japonica</i> (loquat); <i>Malus sylvestris</i> (apple); <i>Prunus armeniaca</i> (apricot); <i>Prunus avium</i> (cherry); <i>Prunus domestica</i> (plum); <i>Prunus persica</i> (peach); <i>Prunus persica</i> var. <i>nectarina</i> (nectarine); <i>Pyrus communis</i> (pear); <i>Rubus fruticosus</i> (blackberry); <i>Rubus ursinus</i> (loganberry)	<i>Prunus cerasifera</i> (ornamental plum)
			<i>Coffea arabica</i> (coffee)	
	Rubiaceae			
	Rutaceae	<i>Acronychia acidula</i> ;	<i>Casimiroa edulis</i> (white sapote);	<i>Aegle marmelos</i> (bael fruit)
		<i>Acronychia</i> sp. (aff. <i>laevis</i>);	<i>Citrus limon</i> (lemon);	
		<i>Eremocitrus glauca</i>	<i>Citrus maxima</i> (pomelo);	
			<i>Citrus medica</i> (citron);	
			<i>Citrus paradisi</i> (grapefruit);	
			<i>Citrus reticulata</i> (mandarin);	
			<i>Citrus sinensis</i> (orange);	
			<i>Fortunella japonica</i> (kumquat)	
	Sapindaceae	<i>Castanospora alphandii</i> ;		
		<i>Ganophyllum falcatum</i>		
	Sapotaceae	<i>Amorphospermum antilogum</i> ;		
		<i>Mimusops elengi</i> ;		
		<i>Niemeyera chartacea</i> ;		
		<i>Planchonella australis</i> ;		
		<i>Planchonella pohlmaniana</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
	Siphonodontaceae	<i>Siphonodon australis</i>		
	Smilacaceae	<i>Rhipogonum papuanum</i>		
	Solanaceae	<i>Solanum laciniatum</i> ; <i>Solanum mauritianum</i> ; <i>Solanum seaforthianum</i>	<i>Capsicum frutescens</i> (capsicum); <i>Lycopersicon lycopersicum</i> (tomato); <i>Physalis peruviana</i> (cape gooseberry)	
	Vitaceae	<i>Cissus</i> sp.	<i>Vitis labruscana</i> (isabella grape); <i>Vitis vinifera</i> (grape)	
<i>B. (Bactrocera) umbrosa</i>	Moraceae		<i>Artocarpus</i> spp. (jackfruit)	
<i>B. (Diplodacus) signatifer</i>	Barringtoniaceae	<i>Barringtonia calyptata</i>		
	Capparidaceae	<i>Capparis lucida</i>		
<i>B. (Gymnodacus) calophylli</i>	Guttiferae	<i>Calophyllum inophyllum</i>		
<i>B. (Gymnodacus) hastigerina</i>	Anacardiaceae	<i>Spondias</i> sp.		
<i>B. (Hemisurstylus) melanoscutata</i>	Guttiferae		<i>Garcinia xanthochymus</i>	
<i>B. (Hemizeugodacus) aglaiae</i>	Meliaceae	<i>Aglaia ferruginea</i> ; <i>Aglaia sapindina</i>		
	Sapindaceae	<i>Ganophyllum falcatum</i>		
<i>B. (Hemizeugodacus) aurea</i>	Alangiaceae	<i>Alangium villosum</i> subsp. <i>tomentosum</i>		
<i>B. (Javadacus) aberrans</i>	Lauraceae	<i>Cinnamomum oliveri</i> ; <i>Cinnamomum virens</i> ; <i>Litsea leefeana</i> ; <i>Litsea reticulata</i>		
<i>B. (Melanodacus) nigra</i>	Icacinaceae	<i>Gomphandra australiana</i>		
	Lauraceae	<i>Cryptocarya</i> sp.		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
<i>B. (Notodacus) xanthodes</i>	Oleaceae	<i>Olea paniculata</i>		
	Symplocaceae	<i>Symplocos thwaitesii</i>		
	Bromeliaceae		<i>Ananas comosus</i> (pineapple)	
	Barringtoniaceae	<i>Barringtonia edulis</i>		
	Caricaceae		<i>Carica papaya</i> (papaya)	
	Cucurbitaceae		<i>Citrullus lanatus</i> (watermelon)	
	Myrtaceae		<i>Psidium guajava</i> (guava)	
	Passifloraceae		<i>Passiflora quadrangularis</i> (granadilla)	
	Rutaceae		<i>Citrus</i> sp.	
	Solanaceae		<i>Lycopersicon lycopersicum</i> (tomato)	
<i>B. (Paradacus) decipiens</i>	Cucurbitaceae		<i>Cucurbita pepo</i> (pumpkin)	
<i>B. (Paratridacus) atrisetosa</i>	Cucurbitaceae		<i>Citrullus lanatus</i> (watermelon); <i>Cucumis sativus</i> (cucumber); <i>Cucurbita pepo</i> (pumpkin, squash)	
	Meliaceae	<i>Aglaia sapindina</i>		
	Solanaceae		<i>Lycopersicon lycopersicum</i> (tomato)	
	Guttiferae	<i>Garcinia gibbsiae</i>	<i>Garcinia dulcis</i> ; <i>Garcinia xanthochymus</i>	
<i>B. (Polistomimetes) decurtans</i>	Rhizophoraceae	<i>Carallia brachiata</i>		
<i>B. (Polistomimetes) murrayi</i>	Anacardiaceae	<i>Semecarpus australiensis</i>		

Fruit Fly Species	Plant Family	Wild Host	Commercial Host	Ornamental Host
	Moraceae	<i>Ficus</i> sp.		
<i>B. (Polistomimetes) visenda</i>	Guttiferae	<i>Garcinia gibbsiae</i> ; <i>Garcinia warrenii</i>		
<i>B. (Zeugodacus) chorista</i>	Cucurbitaceae	<i>Diplocyclos palmatus</i>		
<i>B. (Zeugodacus) cucurbitae</i>	Cucurbitaceae	<i>Momordica charantia</i>	<i>Cucumis melo</i> (rockmelon); <i>Cucumis sativus</i> (cucumber); <i>Cucurbita pepo</i> (marrow)	
<i>B. (Zeugodacus) trichota</i>	Cucurbitaceae	Native cucurbit species (May 1962a)		
<i>D. (Callantra) axanus</i>	Cucurbitaceae		<i>Trichosanthes anguina</i> (guada bean)	
<i>D. (Callantra) petioliforma</i>	Cucurbitaceae		<i>Trichosanthes anguina</i> (guada bean)	
<i>D. (Callantra) smieroides*</i>	Cucurbitaceae	<i>Luffa acutangula</i>		
<i>D. (Callantra) solomonensis</i>			<i>Cucumis sativus</i> (cucumber); <i>Cucurbita pepo</i> (pumpkin)	
<i>D. (Dacus) absonifacies</i>	Asclepiadaceae	<i>Marsdenia rostrata</i> (pupae develop within the fruit)		
<i>D. (Dacus) secamoneae</i>	Asclepiadaceae	<i>Secamone elliptica</i>		
<i>D. (Didacus) aequalis</i>	Asclepiadaceae	<i>Marsdenia rostrata</i> (pupae develop within the fruit)		
<i>D. (Didacus) hardyi</i>	Asclepiadaceae	<i>Cynanchum</i> sp.		

* *D. smieroides* does not occur in the region covered by this monograph but is included because of morphological and host relationships to other species.

The South Pacific Dacinae have been recorded from endemic fruits belonging to 46 families (Table 2). This list does not include introduced host plants. Only species in the genus *Dacus* (fused abdominal terga species) have been recorded from Asclepiadaceae. The other recorded hosts of this genus belong to the Cucurbitaceae. These 2 plant families (plus Passifloraceae) contain the majority of hosts of most African Dacinae (Munro, 1984; Hancock, 1986) and these also belong to genus *Dacus*. The Asclepiadaceae are mostly tropical in distribution and are concentrated in Africa while the Cucurbitaceae are abundant throughout the tropics (Willis, 1960).

Forty-five plant families (other than Asclepiadaceae) contain the recorded hosts of the genus *Bactrocera* (free abdominal terga species). These plants occur primarily in the tropical and subtropical rainforests. Close to the equator such forests grow from sea level to an altitude of ca. 2400 m. There is a change in distribution of plant species with altitude but no associated change in the distribution of dacine species except for a few that have been collected only at higher altitudes in Papua New Guinea.

In Africa, the tribe Ceratitini occupies soft fleshy fruits similar to those that are occupied by the Dacinae in the South Pacific and Asian regions. This fleshy fruit niche is occupied by the genera *Rhagoletis* and *Anastrepha* in the southern Nearctic and Neotropical regions.

The major pest species such as *B. tryoni* and *B. neohumeralis* have a broad forest host range. It is apparent in Australia that this characteristic enabled these species to spread into cultivated fruits introduced by European settlers.

The major natural enemies of the dacine species in the endemic rainforest habitat are the fruit feeding vertebrate animals (Drew, 1987a). There is a large number of canopy and ground dwelling fruit feeders that devour considerable quantities of fruit and cause up to 70 percent reduction in fly populations. The hymenopterous parasites also suffer the same fate and exercise only a small influence in reducing fly populations. It appears that such parasites are not significant mortality factors in the life system of fruit flies in their endemic habitats.

Table 2. Fruit fly species reared from endemic fruits in Australasia and Oceania.

ALANGIACEAE	<i>B. aurea</i>		<i>B. murrayi</i>
ANACARDIACEAE	<i>B. hastigerina</i>		<i>B. tryoni</i>
	<i>B. jarvisi</i>	ANNONACEAE	<i>B. endiandrae</i>
			<i>B. halfordiae</i>
			<i>B. kraussi</i>
			<i>B. neohumeralis</i>
			<i>B. tryoni</i>
		APOCYNACEAE	<i>B. alyxiae</i>
			<i>B. tryoni</i>
		ARECACEAE	<i>B. aquilonis</i>
		ASCLEPIADACEAE	<i>D. absonifacies</i>
			<i>D. aequalis</i>
			<i>D. hardyi</i>
			<i>D. secamoneae</i>
		BARRINGTONIACEAE	<i>B. barringtoniae</i>
			<i>B. jarvisi</i>
			<i>B. signatifera</i>
			<i>B. xanthodes</i>
		CAESALPINIACEAE	<i>B. moluccensis</i>
		CAPPARIDACEAE	<i>B. musae</i>
			<i>B. neohumeralis</i>
			<i>B. signatifera</i>
			<i>B. tryoni</i>
		CELASTRACEAE	<i>B. neohumeralis</i>
			<i>B. tryoni</i>
		CHRYSOBALANACEAE	<i>B. aquilonis</i>
			<i>B. endiandrae</i>
			<i>B. jarvisi</i>
		COMBRETACEAE	<i>B. aquilonis</i>
			<i>B. eximia</i>
			<i>B. frauenfeldi</i>
			<i>B. jarvisi</i>
			<i>B. kirki</i>
			<i>B. laticaudus</i>
			<i>B. mayi</i>
			<i>B. neohumeralis</i>
			<i>B. terminaliae</i>
			<i>B. tryoni</i>
		CUCURBITACEAE	<i>B. bryoniae</i>
			<i>B. chorista</i>
			<i>B. cucumis</i>
			<i>B. cucurbitae</i>
			<i>B. trichota</i>
			<i>B. atrisetosa</i>
			<i>D. axanus</i>
			<i>D. petioliforma</i>
		CUNONIACEAE	<i>B. halfordiae</i>
			<i>B. kraussi</i>
			<i>B. tryoni</i>

DAVIDSONIACEAE	<i>B. tryoni</i>		<i>B. obliqua</i>
EBENACEAE	<i>B. diospyri</i> <i>B. manskii</i> <i>B. tryoni</i>	NAUCLEACEAE	<i>B. tryoni</i> <i>B. neohumeralis</i> <i>B. pallida</i> <i>B. tryoni</i>
ELAEOCARPACEAE	<i>B. aquilonis</i> <i>B. cacuminata</i>	OLEACEAE	<i>B. jarvisi</i> <i>B. kraussi</i> <i>B. neohumeralis</i> <i>B. nigra</i> <i>B. tryoni</i>
EUPHORBIACEAE	<i>B. breviaculeus</i> <i>B. cucumis</i> <i>B. kraussi</i> <i>B. laticaudus</i> <i>B. neohumeralis</i> <i>B. tryoni</i>	OPILIACEAE	<i>B. opiliae</i>
FLACOURTIACEAE	<i>B. kraussi</i>	PASSIFLORACEAE	<i>B. bryoniae</i> <i>B. melas</i> <i>B. neohumeralis</i> <i>B. tryoni</i>
GUTTIFERAE	<i>B. barringtoniae</i> <i>B. bullata</i> <i>B. calophylli</i> <i>B. expandens</i> <i>B. melanoscutata</i> <i>B. visenda</i>	POTALIACEAE	<i>B. fagraea</i>
ICACINACEAE	<i>B. kraussi</i> <i>B. nigra</i>	RHAMNACEAE	<i>B. tryoni</i>
LAURACEAE	<i>B. aberrans</i> <i>B. endiandrae</i> <i>B. kraussi</i> <i>B. neohumeralis</i> <i>B. nigra</i> <i>B. nigrovittata</i> <i>B. terminaliae</i> <i>B. tryoni</i>	RHIZOPHORACEAE	<i>B. decurtans</i>
		RUBIACEAE	<i>B. luteola</i>
		RUTACEAE	<i>B. aquilonis</i> <i>B. halfordiae</i> <i>B. kraussi</i> <i>B. neohumeralis</i> <i>B. tryoni</i>
		SAPINDACEAE	<i>B. aglaiae</i> <i>B. kraussi</i> <i>B. neohumeralis</i> <i>B. tryoni</i>
MELIACEAE	<i>B. aglaiae</i> <i>B. aquilonis</i> <i>B. atrisetosa</i> <i>B. cacuminata</i> <i>B. jarvisi</i> <i>B. tryoni</i>	SAPOTACEAE	<i>B. distincta</i> <i>B. frauenfeldi</i> <i>B. halfordiae</i> <i>B. jarvisi</i> <i>B. laticaudus</i> <i>B. mayi</i> <i>B. mendosa</i> <i>B. neohumeralis</i> <i>B. pulchra</i> <i>B. tenuifascia</i> <i>B. tryoni</i>
MENISPERMACEAE	<i>B. tinomiscii</i>	SIPHONODONTACEAE	<i>B. tryoni</i>
MORACEAE	<i>B. bancroftii</i> <i>B. halfordiae</i> <i>B. murrayi</i> <i>B. tryoni</i> <i>B. umbrosa</i>	SMILACACEAE	<i>B. halfordiae</i> <i>B. tryoni</i>
MUSACEAE	<i>B. musae</i>	SOLANACEAE	<i>B. cacuminata</i> <i>B. dapsiles</i> <i>B. neohumeralis</i> <i>B. nigrovittata</i> <i>B. tryoni</i>
MYRTACEAE	<i>B. aquilonis</i> <i>B. fagraea</i> <i>B. frauenfeldi</i> <i>B. halfordiae</i> <i>B. jarvisi</i> <i>B. kraussi</i> <i>B. musae</i> <i>B. neohumeralis</i>	STRYCHNACEAE	<i>B. bryoniae</i>

	<i>B. manskii</i>
SYMPLOCACEAE	<i>B. nigra</i>
THYMELAEACEAE	<i>B. halfordiae</i>
	<i>B. kraussi</i>
	<i>B. phaleriae</i>
VITACEAE	<i>B. tryoni</i>
XANTHOPHYLLACEAE	<i>B. tinomiscii</i>

ADULT BEHAVIOUR

The host plant is the focal point of activity of fruit flies, and the relationship of the flies to their host involves host seeking, adult feeding, egg development, mating behaviour and oviposition.

The adults feed within the host tree on certain bacteria which supply nutrients for development to sexual maturity (Drew et al., 1983; Courtice and Drew, 1984). The first flies to arrive in the host tree when fruit become susceptible to oviposition are primarily immature females and sexually mature males (Drew and Lloyd, 1987). The flies introduce bacteria of the family Enterobacteriaceae onto the fruit surfaces. Within 7–14 days most fruits have a heavy growth of "fruit fly type" bacteria. The nutrient supply for such bacteria colonisation is provided by leachates, defined as chemicals (inorganic and organic) that occur within a plant and which exude onto the plant surface (Tukey, 1971). Leaching is prominent on soft fleshy fruits when they begin to ripen and is heavy under conditions of wetting during light rain, dew and cloud mist (Tukey, 1971). In tropical and subtropical regions there are usually 2 distinct seasons, a warm wet season and a cool dry season. During the dry there is a build up of soluble nitrogen in the soil which then becomes available to the plant in the wet season, increasing the soluble nitrogen concentration in the sap (Courtice and Drew, 1984; White, 1984). Such increase in nitrogen flow is significant in causing an increase in survival and abundance of phytophagous insects (White, 1984). The nitrogen flow from the soil is important in increasing the nitrogen in the leachates (Courtice and Drew, 1984) which in turn benefits bacteria colonisation of the fruit surfaces. Thus, the increased leaching and bacterial growth during a warm wet season may have the effect of concentrating nitrogen on the plant surface and influencing dacine activity.

Egg development and mating occur within the host tree (Drew and Lloyd, 1987). Protein food is an essential prerequisite to both activities, further emphasising that the flies are feeding within the host plant. Studies on feeding in a mulberry tree in Brisbane (Drew et al., 1983) have shown that

females contain different crop contents (in colour and bacteria content) from males and that females feed on the fruit surfaces. The males do not feed upon the fruit surfaces and have different nutritional requirements (Drew, 1987b).

Considering that immature females and mature males are the stages mostly attracted to host trees, that each sex has different feeding sites and nutritional requirements, that females feed on the host fruit surfaces and mating occurs in the host trees (Drew, 1987b), it is possible that the host tree stimuli that attract the flies to the tree are food attractants to the female and sex attractants to the male. These stimuli could be both visual and olfactory, however, visual stimuli would seem insignificant in the endemic rainforest habitat where flies must locate host fruit scattered randomly throughout a dense forest canopy. On the other hand, the Dacinae are known to respond to various odours, e.g., a range of male lures (Drew, 1974b; Drew and Hooper, 1981), ammonia (Bateman and Morton, 1981) and certain bacterial emissions (Keiser and Wakabayashi, 1981; Drew, unpub. data). It seems that host odours are significant in attracting flies to the plants, and because the flies arrive when the fruit reaches a particular stage, host fruit odours may be particularly significant. Chemicals such as 2-butanone (the most attractive part of the cue lure molecule) have been recorded from fresh fruit (Nursten, 1970) and are emitted by some "fruit fly type" bacteria growing on proteinaceous substrates (Drew, 1987b).

The exact site of origin of plant chemicals that attract flies to hosts is unknown. However, the possibility exists that some attractants are produced by bacteria growing on fruit surfaces. It is also possible that the biological significance of the male fruit fly attractants is in these host plant odours attracting sexually mature males into the host plants to ensure mating success (Drew, 1987b).

Host plant odours are long distance attractants drawing the immature females and mature males into the trees. Following that, the short distance male pheromones are involved in mating behaviour. Observations on *B. tryoni* have shown that males position themselves under leaves at dusk, push their wings over the anal area using the hind legs and then vibrate the wings, apparently dispersing pheromone from the rectal sac. This procedure is repeated many times and the male often turns around in a circle observing females that are attracted to adjacent leaves. Eventually the male either mates with 1 of the females or, if no females are attracted within 30–60 minutes, departs to another leaf. This combination of host plant

odours and male pheromones would fall into the category of Specific-Mate Recognition Systems (SMRS) proposed by Paterson (1985) as essential in drawing the sexes together as the central basis of an alternative view of species — the Recognition Concept.

The long-accepted theory of genetic species, due to Dobzhansky and Mayr, espouses the view that reproductive isolating mechanisms develop within two or more parts of an originally interbreeding population. These "isolating mechanisms" then act as a barrier to gene flow thus resulting in the evolution of separate species. Although this isolation theory has been called the biological species concept, most discussions on the topic ignore basic biology and concentrate on genetic aspects. While genetic changes are essential in speciation, it is probable that an understanding of the biology of organisms will throw greater light on the processes of natural selection. For example, one could expect that a change in the reproductive behaviour of a portion of an existing species is a necessary precursor to the development of another species. Under the biological species concept, reproductive behaviour is viewed as ethological isolation, ignoring the obvious fact that this behaviour clearly relates to the achieving of intraspecific fertilization. It is a relational concept in which 2 isolated populations have, at some stage, shared a common reproductive behaviour. Consequently, such speciation could only have occurred in sympatry.

Bush (1974) proposed a genetic model for speciation based on host recognition. However, the majority of the Dacinae are single host species and the host plant is the significant rendezvous and mating site. For speciation, therefore, mate recognition is the primary biological advantage of host recognition. There are also other mate recognition systems that exist within the host plant. For example, 2 *dorsalis* complex species in Malaysia mate within the same host but never interbreed (Drew, unpubl. data). Each species possesses a markedly different male pheromone that is released at dusk during courtship. With such species, host recognition is not alone sufficient and specific-mate recognition factors must be employed. Bush's views have recently come under critical reassessment (Futuyma and Mayer, 1980; Paterson, 1981; Jaenike, 1981).

The more that biological factors associated with reproduction in fruit flies are understood, the clearer becomes the Recognition Concept of Species proposed by Paterson (1985). In the dacine sibling species that we have studied, no reproductive isolating mechanism exists or, where

one appears to exist, it is environmentally dependent and easily destroyed. For example, there are documented cases of hybridisation of species such as *B. neohumeralis* and *B. tryoni* in the laboratory and disturbed environments. It is difficult to imagine that speciation could have such a tenuous basis. In contrast, mate recognition within the host plant is very secure in restricting gene flow and reproductive isolation is probably a by-product.

Speciation in the Dacinae is more easily understood in the development of a new fertilization system (or mating population) closely integrated with a host. The prolific speciation in tropical rainforest plants, the endemic habitat of the Dacinae, has provided unlimited opportunity for accompanying speciation in these flies. Each plant species provides a potential niche into which flies can adapt and develop fertilization systems prior to the development of a new species.

Another difference of the Recognition Concept of Species is that it is not a relational concept as it involves speciation in allopatry. Sympatric speciation faces many genetical difficulties as has been demonstrated by Futuyma and Mayer (1980), Paterson (1981) and Jaenike (1981). Defining species in terms of fertilization systems which have evolved to bring about fertilization offers a new and effective way of viewing dacine reproductive behaviour.

The role of SMRS on speciation within the Dacinae is an area deserving research. It is possible that as a population adapts to the odours emitted by a new host plant and its fruit, to which it has been confined in allopatry, it diverges into a species. This would mean that speciation is due to adaptation of responses to particular host plant odours. For example, *B. musae* and *B. tinomiscii* are 2 sympatric sibling species in Papua New Guinea, identifiable only by scanning electron microscopy of the ovipositor. Each species has a different host fruit and the ovipositor is adapted accordingly. Host plant odours are probably central to specific-mate recognition in the development and maintenance of these species. Indeed, the many closely related species described in the 20 species complexes in this monograph are best explained on the basis of responses to specific hosts and host odours. In the Dacinae, members of a species share a common Fertilization System within the normal habitat (host plant) and therefore the habitat is an essential part of the speciation system.

The information described above reflects the importance of biological data to taxonomic studies

and how a knowledge of host plants can be valuable in defining sibling species of *Dacinae*.

GEOGRAPHIC DISTRIBUTION

The *Dacinae* are distributed throughout the tropics and subtropics of the world. Munro (1984) and Hancock (1985) recorded 182 species in Africa while 290 species are recorded in this monograph, covering the South Pacific area from Papua New Guinea and Australia, east to the Society Islands. It is estimated that the Asian and South East Asian fauna will comprise approximately 200 species. Except for *B. oleae*, the only species in the Mediterranean region, the subfamily is restricted to regions of alternating cool dry and warm wet seasons.

The distribution of species is closely linked to that of their host plants. In Africa, most species occur in open woodland (or savannah) with only a few species (those placed in subgenus *Dacus*) occurring in rainforests (Hancock, 1986). This habitat contains the major hosts, Asclepiadaceae and Cucurbitaceae. In Asia, South East Asia and the South Pacific, most species occur in the rainforest habitat where they breed in the soft fleshy fruits of many plant families. Within such areas, some species are restricted, due to the limited distribution of a particular host. For example, *B. halfordiae* occurs in the eastern area of Australia from south-east Queensland to Sydney, breeding in *Planchonella australis* in the higher altitude forests.

Within Australia, the *Dacinae* occur in 2 geographically isolated zones, viz., the northwestern zone (comprising the northern parts of Western Australia and the Northern Territory) and the northeastern zone (the eastern coastline from Cape York in Queensland to East Gippsland in the south). There are some species that occur in both zones and others that are endemic to one zone. Because of the economic importance of the *Dacinae*, the species recorded from each Australian zone are listed in Table 3.

Table 3. Species of *Dacinae* recorded from 2 geographically isolated zones in Australia.

Northwestern Zone			
Genus <i>Bactrocera</i>	Genus <i>Dacus</i>		
<i>B. allwoodi</i>	<i>D. axanus</i>	<i>B. diospyri</i>	
<i>B. aquilonis</i>	<i>D. bellulus</i>	<i>B. jarvisi</i>	
<i>B. bryoniae</i>	<i>D. hardyi</i>	<i>B. mendosa</i>	
<i>B. cucumis</i>	<i>D. newmani</i>	<i>B. opiliae</i>	
<i>B. decurtans</i>	<i>D. secamoneae</i>	<i>B. pallida</i>	
		<i>B. parafrasenfeldi</i>	
		<i>B. signatifer</i>	
		<i>B. tenuifascia</i>	
		Northeastern Zone	
		Genus <i>Bactrocera</i>	
		<i>B. aberrans</i>	<i>B. kraussi</i>
		<i>B. abscondita</i>	<i>B. laticaudus</i>
		<i>B. aeruginosa</i>	<i>B. manskii</i>
		<i>B. aglaiae</i>	<i>B. mayi</i>
		<i>B. alyxiae</i>	<i>B. melanothoracica</i>
		<i>B. amplexiseta</i>	<i>B. melas</i>
		<i>B. antigone</i>	<i>B. mendosa</i>
		<i>B. aurantiaca</i>	<i>B. murrayi</i>
		<i>B. aurea</i>	<i>B. musae</i>
		<i>B. bancroftii</i>	<i>B. mutabilis</i>
		<i>B. barringtoniae</i>	<i>B. neohumeralis</i>
		<i>B. batemani</i>	<i>B. nigra</i>
		<i>B. bidentata</i>	<i>B. notatagena</i>
		<i>B. breviaculeus</i>	<i>B. pallida</i>
		<i>B. brunnea</i>	<i>B. peninsularis</i>
		<i>B. bryoniae</i>	<i>B. perkinsi</i>
		<i>B. cacuminata</i>	<i>B. phaleriae</i>
		<i>B. calophylli</i>	<i>B. pulchra</i>
		<i>B. chorista</i>	<i>B. quadrata</i>
		<i>B. cucumis</i>	<i>B. robiginosa</i>
		<i>B. decurtans</i>	<i>B. romigae</i>
		<i>B. endiandrae</i>	<i>B. rufescens</i>
		<i>B. erubescens</i>	<i>B. rufofuscula</i>
		<i>B. exigua</i>	<i>B. russeola</i>
		<i>B. expandens</i>	<i>B. salamander</i>
		<i>B. fagraea</i>	<i>B. signatifer</i>
		<i>B. fallacis</i>	<i>B. silvicola</i>
		<i>B. frauenfeldi</i>	<i>B. strigata</i>
		<i>B. fuliginus</i>	<i>B. strigifinis</i>
		<i>B. halfordiae</i>	<i>B. tigrina</i>
		<i>B. hispidula</i>	<i>B. tryoni</i>
		<i>B. humilis</i>	<i>B. unirufa</i>
		<i>B. jarvisi</i>	<i>B. visenda</i>
		Genus <i>Dacus</i>	
		<i>D. absonifacies</i>	<i>D. palmerensis</i>
		<i>D. aequalis</i>	<i>D. petioliforma</i>
		<i>D. axanus</i>	<i>D. pusillus</i>
		<i>D. bellulus</i>	<i>D. secamoneae</i>
		<i>D. concolor</i>	<i>D. signatifrons</i>
		<i>D. newmani</i>	

Eleven species are common to both areas, 7 are endemic to the northwestern and 66 endemic to the northeastern zone. Some are closely related, indicating that speciation has occurred between the 2 areas now isolated by a large arid/semiarid land mass, which runs from the Gulf of Carpentaria to the southern and western coastlines of the continent. Species pairs exhibiting such relationships are *B. aquilonis*–*B. tryoni*, *B. decurtans*–*B. murrayi*, *B. opiliae*–*B. endiandrae*, *B. parafrauenfeldi*–*B. frauenfeldi*, *B. tenuifascia*–*B. mayi*.

In addition, *B. diospyri* in the northwestern zone is closely related to *B. exspoliata* in Papua New Guinea, while a large number of species in the northeastern zone either occur or are closely related to species, in Papua New Guinea.

ATTRACTANTS

A large number of Dacinae have been attracted to 1 of the male attractants (cue lure, methyl eugenol). Each species responded to only 1 lure while some did not respond to any.

In the region from Asia to the South Pacific, dacine species respond to both cue lure and methyl eugenol. In Africa, species of Dacinae are attracted to cue lure but not to methyl eugenol. In that region, the methyl eugenol responding species belong to the tribe Ceratitini (subfamily Ceratitinae), which also occupy the soft fleshy fruits of the type utilised by the Dacinae in Asia, South East Asia and the South Pacific. This also supports the thesis that the male lures have their origins in host plant odours.

In the division of the Dacinae into 2 genera, viz., *Dacus* (fused abdominal terga species typified by the African fauna) and *Bactrocera* (free abdominal terga species), the lure responses are significant. Species of *Dacus* (except *D. memnonius* and *D. pusillus*) respond only to cue lure while *Bactrocera* species respond to either cue lure or methyl eugenol. Some subgenera of *Bactrocera* do not contain any species that respond to lures, viz., *Austrodacus*, *Diplodacus*, *Heminotodacus*, *Hemiparatridacus*, *Hemisurstylus*, *Hemizeugodacus*, *Melandacus*, *Queenslandacus*.

DEVELOPMENT OF THE ECONOMIC FRUIT FLY PROBLEM IN AUSTRALIA

European settlement began in Australia, in the area now known as Sydney, in 1788. Since that time, major changes have been made to the environment of endemic Australian animals and plants. This, in turn, has caused significant changes in the distribution and abundance of many

endemic insect species. Significantly, some species have become serious pests of introduced food crops. Several species of fruit fly fall into this category, the most important of which is the Queensland fruit fly (*B. tryoni*). The historical development of the fruit fly problem in Australia becomes primarily a study of the evolution of *B. tryoni* as a pest species along the eastern coastline.

From the first years of settlement, extensive plant introductions took place. A large range of vegetable and fruit plants were well established by the turn of the 19th century (Wentworth, 1819). Although some crops were suffering insect problems, the fruit trees known today as major fruit fly hosts, e.g. peaches, plums, apricots, mulberry, apples and oranges, had no recorded fruit losses due to insect attack (Wentworth, 1819). Indeed, in describing the Colonial garden, Wentworth noted that peaches, apricots, nectarines, oranges, grapes, pears, plums and melons grew to maturity in very great abundance and that peaches were the most abundant of all. There were enough peach varieties to allow fruiting from November to March and fruit production was so plentiful that it was used for pig food, while peach cider was produced in great quantities. This indicates that in the Sydney area, from settlement to 1819, no fruit fly problems were experienced.

The earliest record of fruit fly damage in south-east Queensland was at Toowoomba in 1853 (Tryon, 1889). Tryon records that the fly "has been known as a pest on the Darling Downs ever since fruit has been grown there". A village was first built at the location now known as Toowoomba in 1849 and this settlement declared a town in 1860. It would appear, therefore, that fruit fly was a problem in that area as soon as the first fruit trees were bearing. Tryon also reports that at Toowoomba in 1869 "not only were the stone fruits destroyed by the fruit fly, but even the guavas also". Jarvis (1925) recorded damage to deciduous crops in Brisbane as early as 1864. Although the Moreton Bay settlement (now known as Brisbane) began in 1824, the climate of the area is not conducive to the growing of good deciduous fruit crops, in contrast to the more temperate climate of Toowoomba. It is possible, therefore, that the fruit fly did not make the same impact in the Brisbane area although it must have been present.

The earliest record of fruit fly in New South Wales is provided by Farwell (1973), quoting Edward Ogilvie reporting in his diary in mid-February 1853 "I made the agreeable discovery that the maggot, which has hitherto confined its ravages to the peaches and apples, has now found out that grapes will also suit its taste". Ogilvie lived on the

Clarence River and from this we can assume that the fly was active in north-east New South Wales prior to 1853. Tryon (1889) recorded that fruit fly grubs were noticed in peaches as early as 1853 at Kiama, south from Sydney. Tryon also reported a Mr. MacStay, an experienced horticulturist, stating that "the fruit growing in the gardens in the district of Sydney was not worth gathering, owing to the extent to which it would be infested by the fruit fly maggot", when much rain was about. This record must have been prior to 1889. Froggatt (1909) noted that fruit fly was a pest in New South Wales as early as 1852.

Birch (1965) suggested that *B. tryoni* underwent genetic change by hybridising with *B. neohumeralis* and consequently moved south from Queensland to invade Sydney in 1895 and East Gippsland (Victoria) in 1947. This chronology is not supported by the data given above.

The earliest known Dacinae collected in Australia are 2 specimens of *B. halfordiae* in the Macleay collection, University of Sydney. These were collected in the Sydney area, sometime between 1830 and 1850. An important wild host of this species, *Schizomeria ovata*, is endemic to the Sydney region. *B. halfordiae* has never been recorded from peaches and has a temperate distribution, ranging from Sydney to south-east Queensland and in the northern limits it occurs mostly at higher altitudes. There is little doubt that *B. halfordiae* was the only endemic Dacinae along the central and southern New South Wales coastline before European settlement. Even as late as Froggatt (1910), this species was being incorrectly called *B. tryoni* in the Sydney area, although the latter species was described by Froggatt (1897). A large series of specimens labelled "Narara, 4.2.1910, from White Ash berries", in the N.S.W. collection, are *B. halfordiae* and incorrectly identified as *B. tryoni*.

The early records of fruit fly problems in commercial fruits in south-east Queensland and coastal New South Wales could only be due to either *B. tryoni* or *B. neohumeralis*, or both. These species coexist in some of the same endemic rainforest fruits which occur throughout eastern Queensland and north-east New South Wales (e.g. *Drypetes australasica* [Muell. Arg.] Pax and K. Hoffman) and so there is no reason to assume that introduced fruit cultivation has brought them together to hybridise as stated by Birch (1965). The theory that such hybridisation was important in producing a more cold tolerant *B. tryoni* which hastened its southern spread is most unlikely. *B. neohumeralis* appears more tropical, having colonised the northern tropical lands such as

Papua New Guinea and the Torres Strait islands where *B. tryoni* does not exist. From Cape York to south-east Queensland, both species occur in equal numbers in cue lure trap catches and often in fruit infestations. It has also been demonstrated by Gee (1969) that each species has an entirely different daily mating period and Meats (1976) has shown that *B. tryoni* has a natural ability to survive low temperatures.

It appears that *B. tryoni* and *B. neohumeralis* are endemic in the tropical and subtropical rainforests of the eastern coastal areas of Queensland and northern New South Wales and that *B. tryoni* extended its southern limit to the Sydney area sometime between the period recorded by Wentworth (1819) and the early 1850's recorded by Tryon (1889).

Between 1820 and 1840, European settlements were established along the coastline. This involved major clearing of forests and the growing of introduced commercial fruit plants, especially stone fruits such as peaches. In Queensland and north-east New South Wales, the clearing of lowland rainforests (the endemic habitat of the flies) and the establishment of introduced fruits in the cleared areas provided a more abundant supply of larval food without the natural population reducing mechanisms. The chief mechanisms in the endemic habitat of the fly are the fruit feeding vertebrate animals (Drew, 1987a).

Consequently, the populations of *B. tryoni* and *B. neohumeralis* were able to increase unchecked and, in the case of *B. tryoni*, expand southwards as larval food plants became available. As noted under Biology, these same plants are important adult feeding sites also. As long as climatic conditions permit an adequate supply of larval and adult food, in the absence of biocontrol systems, populations of fruit fly species which have potential to exploit commercial fruits will expand in both distribution and abundance.

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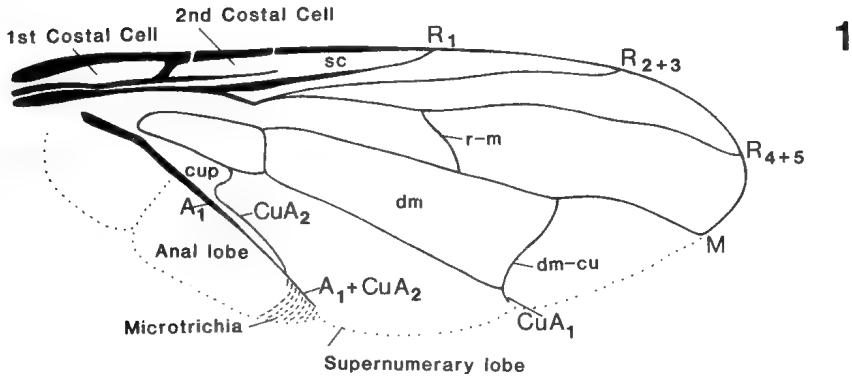


FIG. 1. Terminology used for Dacinae wing venation and cells —

veins

A₁, branch of anal vein
 CuA₁, CuA₂, anterior branches of cubitus
 dm-cu, discal medial-cubital crossvein
 M, media
 R₁, anterior branch of radius
 R₂₊₃, R₄₊₅, combined posterior
 branches of radius
 r-m, radial-medial

cells

cup, posterior cubital
 dm, discal medial
 sc, subcostal

2

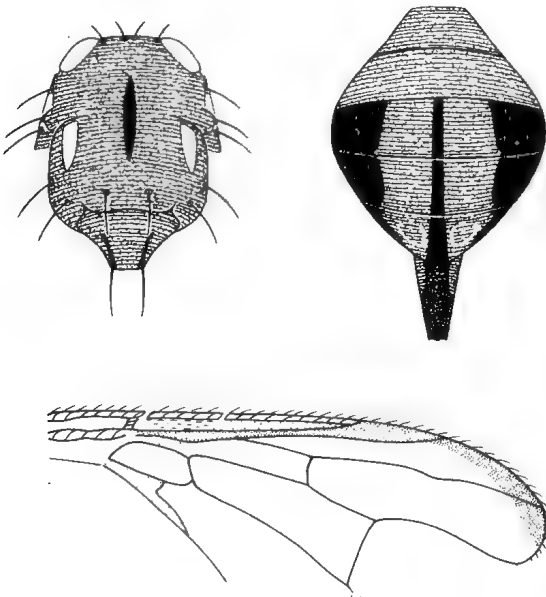
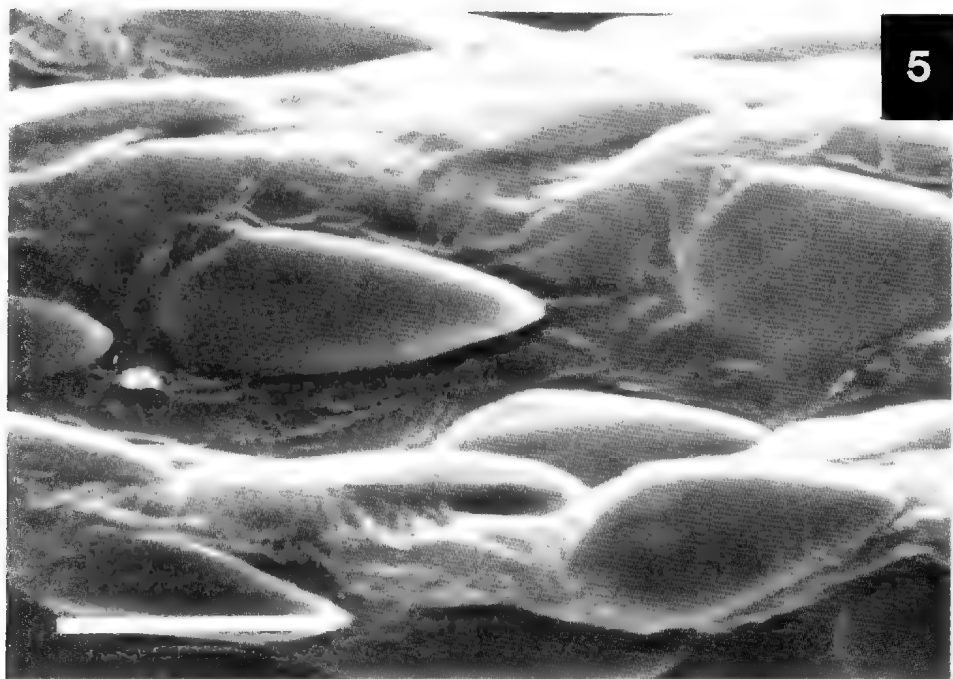
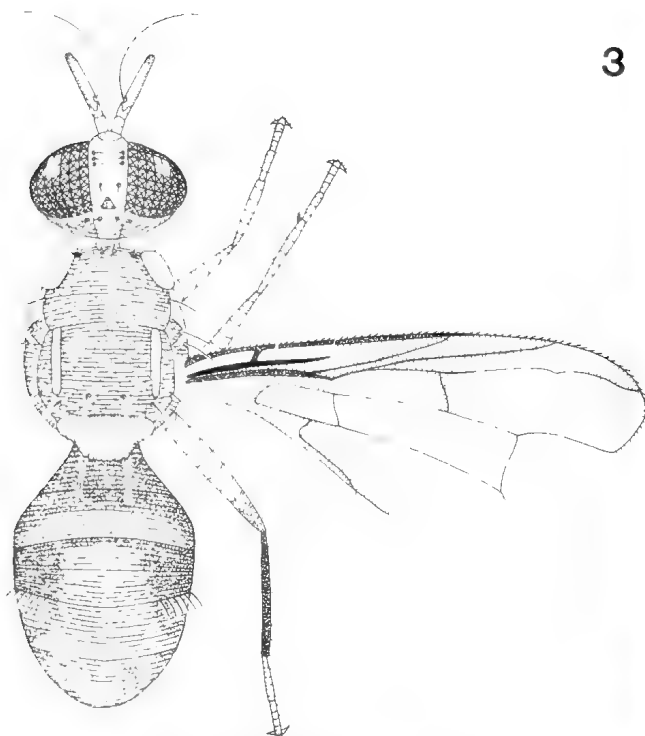
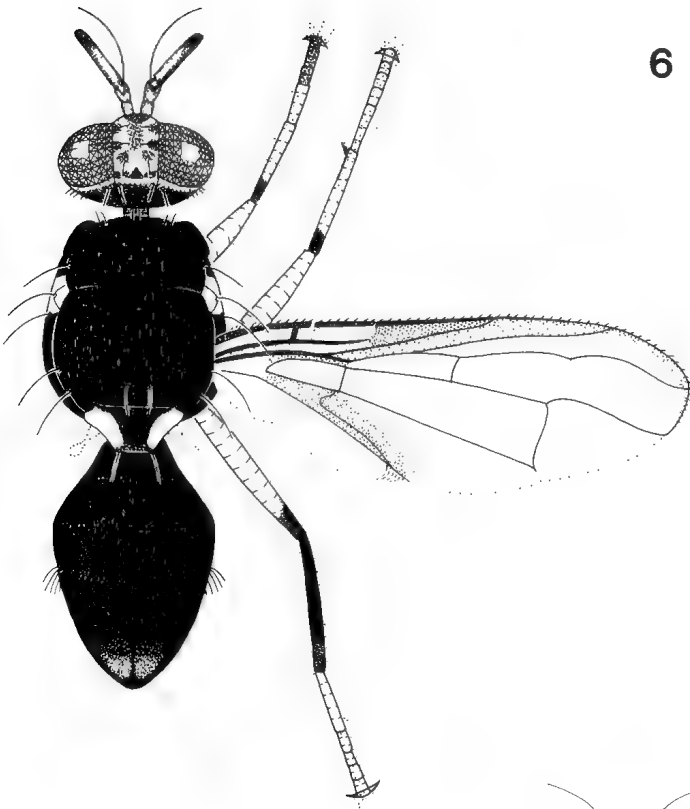


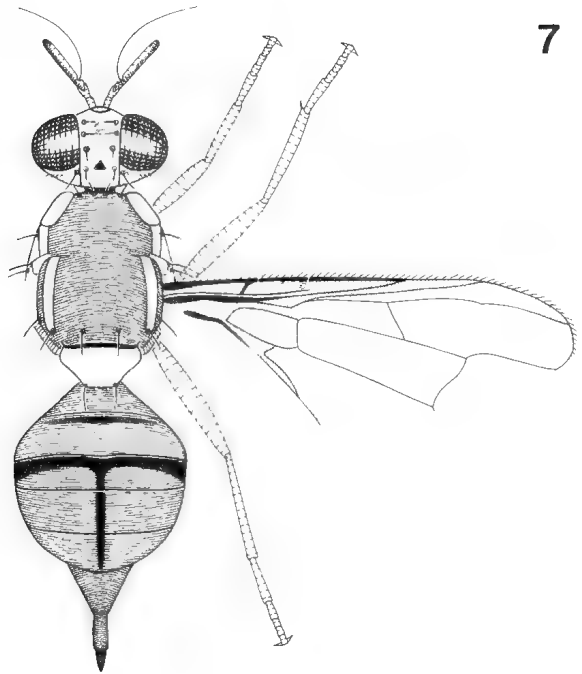
FIG. 2. *Bactrocera (Afrodacus) aenigmatica* (Malloch), (x13).



FIGS 3-5. *Bactrocera (Afrodacus) brunnea* (Perkins and May): 3, adult male (x10); 4, apex of aculeus (scale 0.1 mm); 5, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

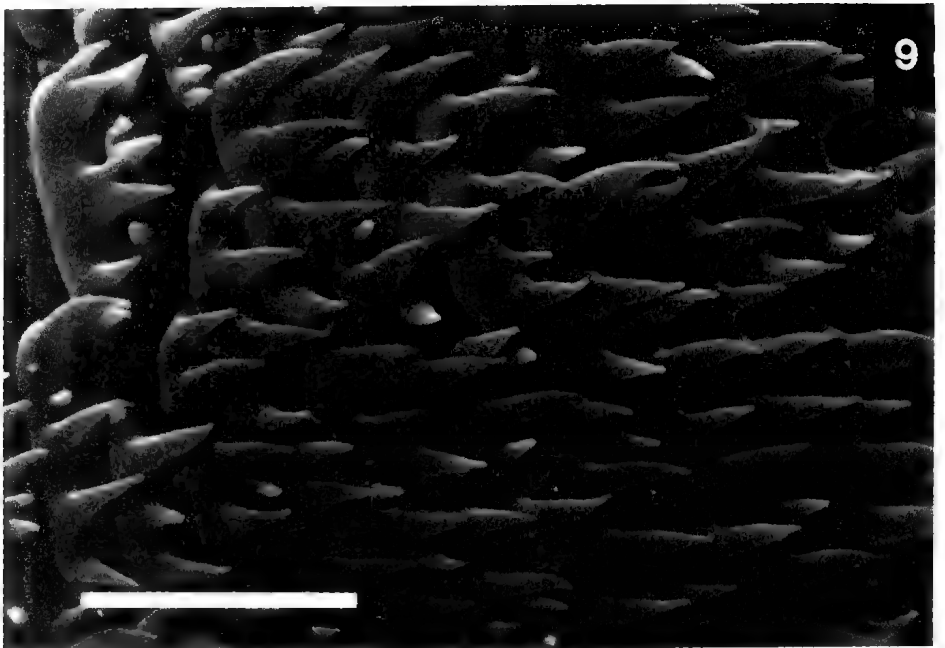
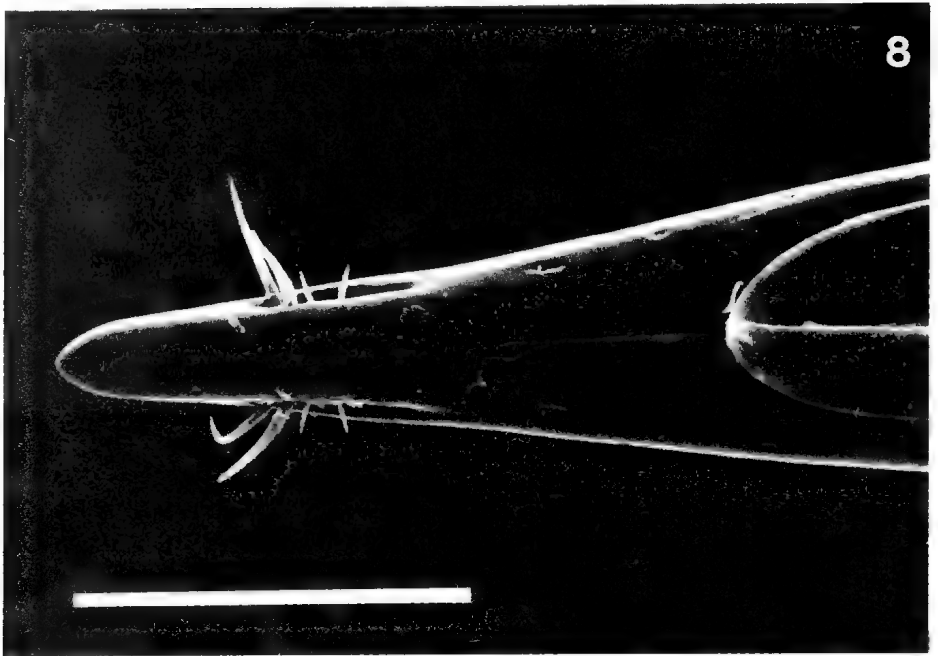


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FIG. 6. *Bactrocera (Afrodacus) hypomelaina* n. sp., adult male (x9). FIG. 7. *Bactrocera (Afrodacus) jarvisi* (Tryon), adult female (x9).



FIGS 8 9. *Bactrocera (Afrodacus) jarvisi* (Tryon): 8, apex of aculeus (scale 0.1 mm); 9, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

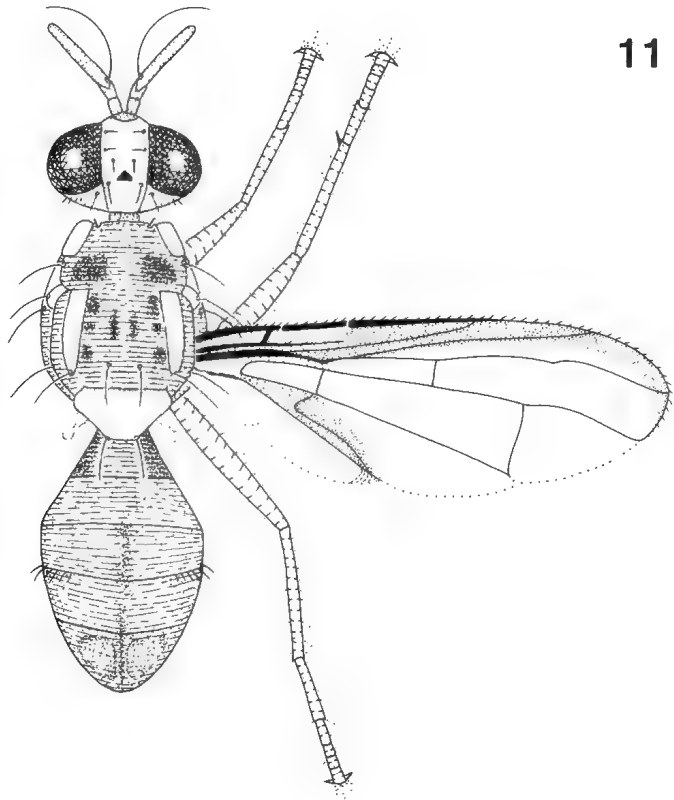
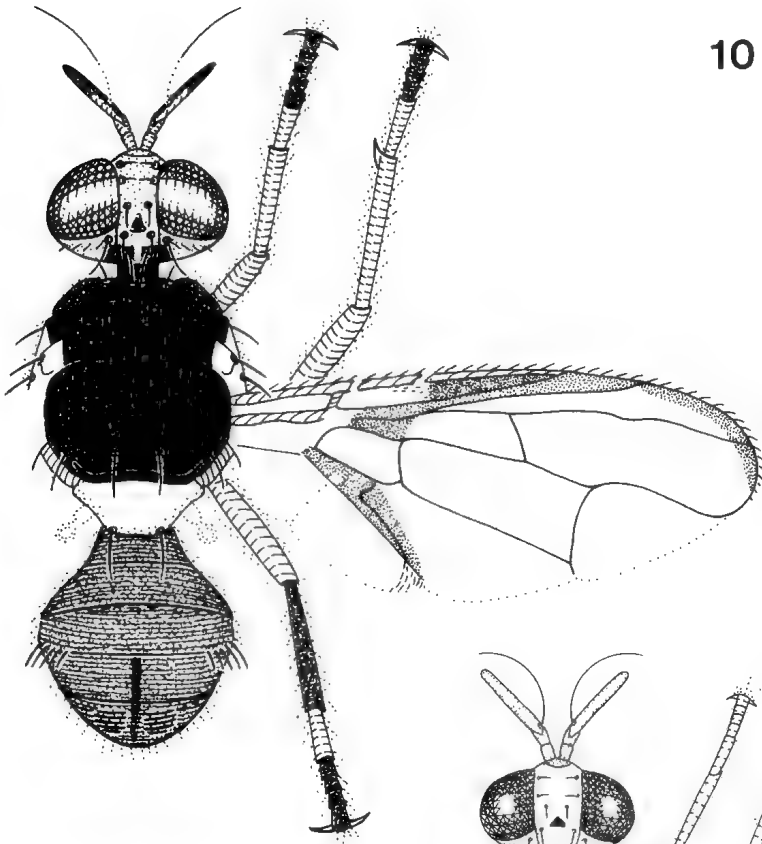
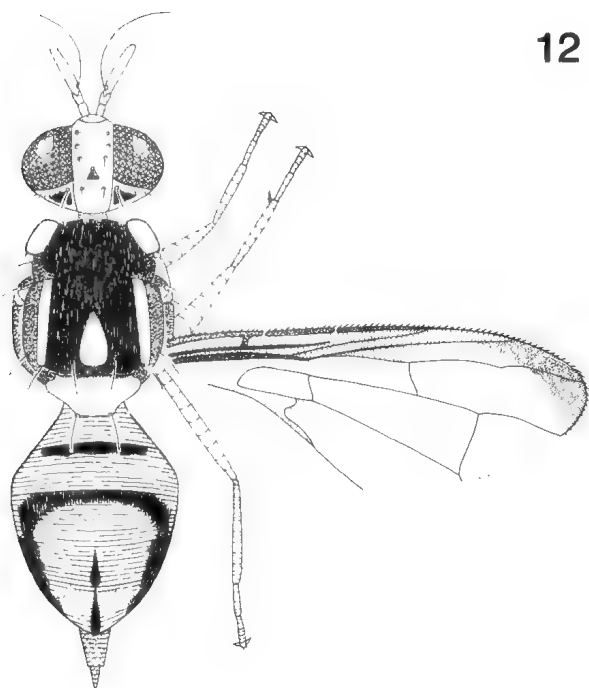
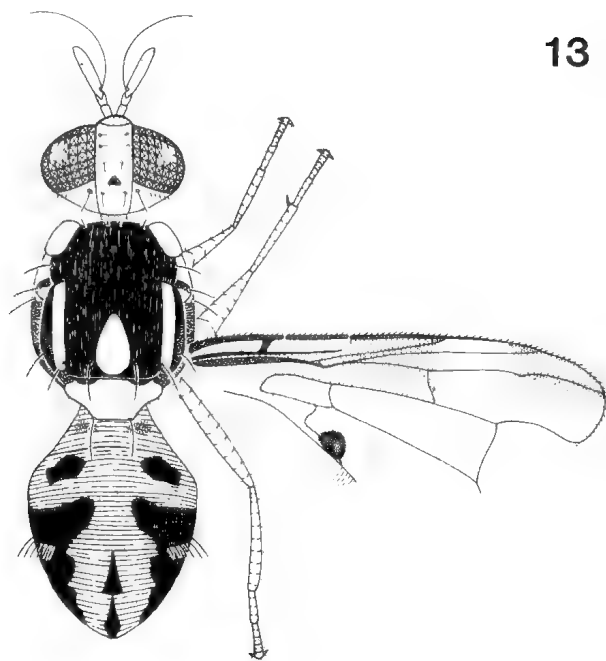


FIG. 10. *Bactrocera* (*Afrodacus*) *minuta* (Drew), adult male (x16). FIG. 11. *Bactrocera* (*Afrodacus*) *ochracea* n. sp., adult male (x11).

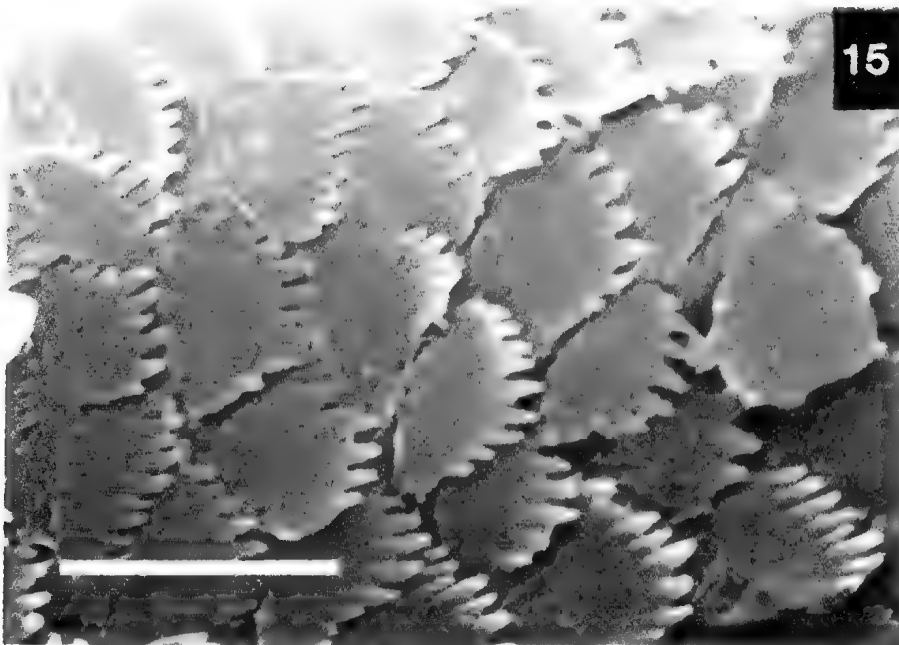
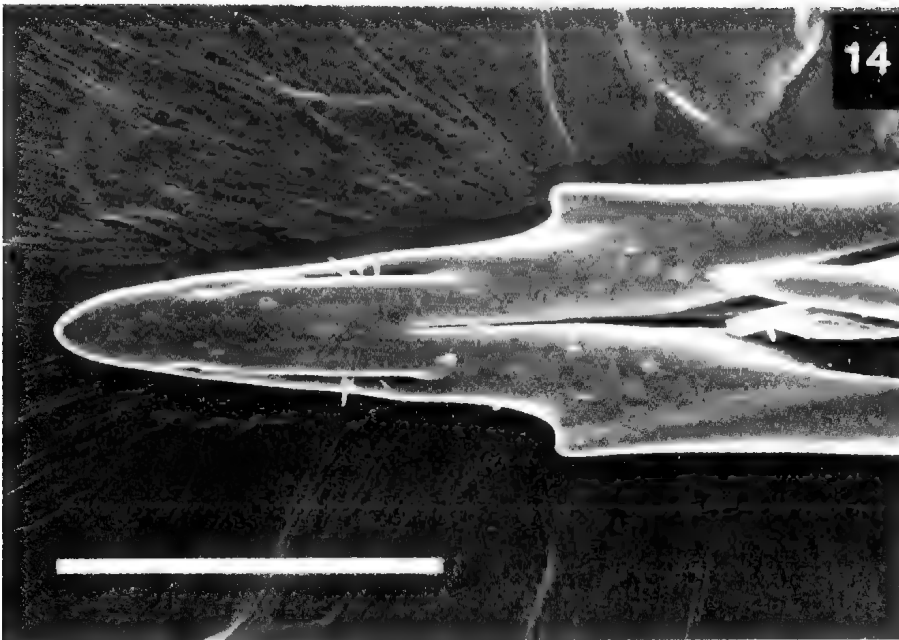


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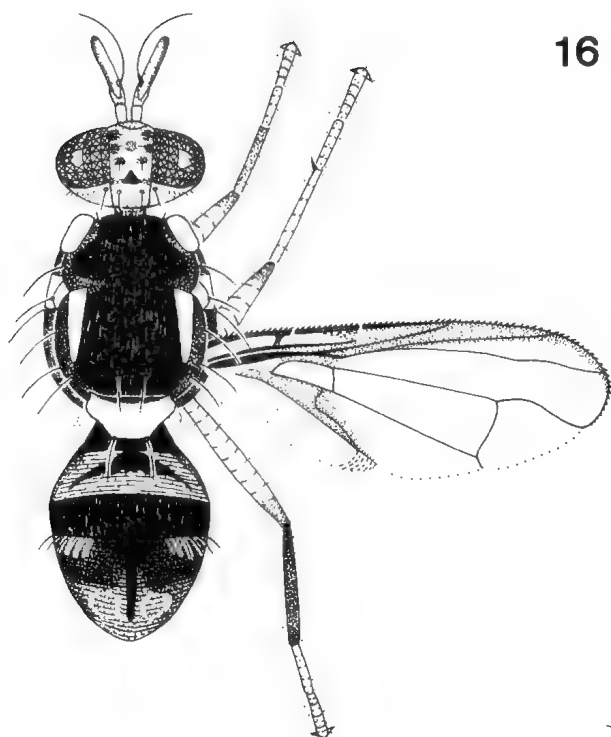


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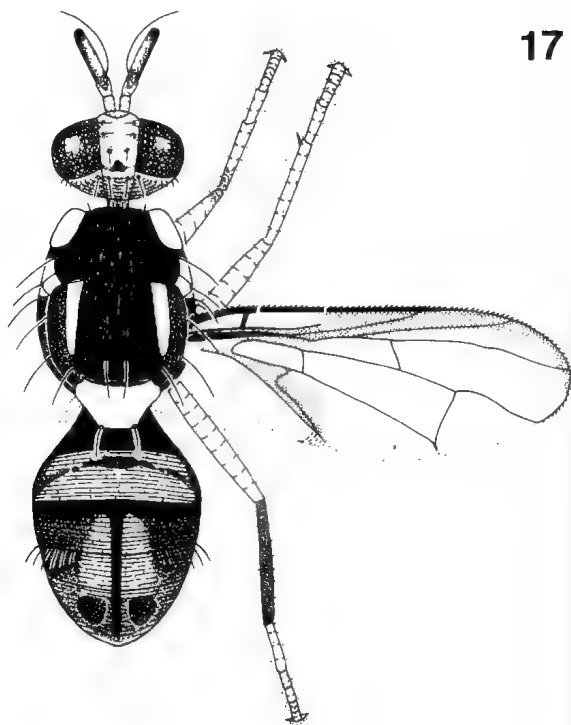
FIGS 12–13. *Bactrocera* (*Afrodacus*) *tigrina* (May): 12, adult female (x12); 13, adult male (x14).



FIGS 14–15. *Bactrocera (Afrodacus) tigrina* (May): 14, apex of aculeus (scale 0.1 mm); 15, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

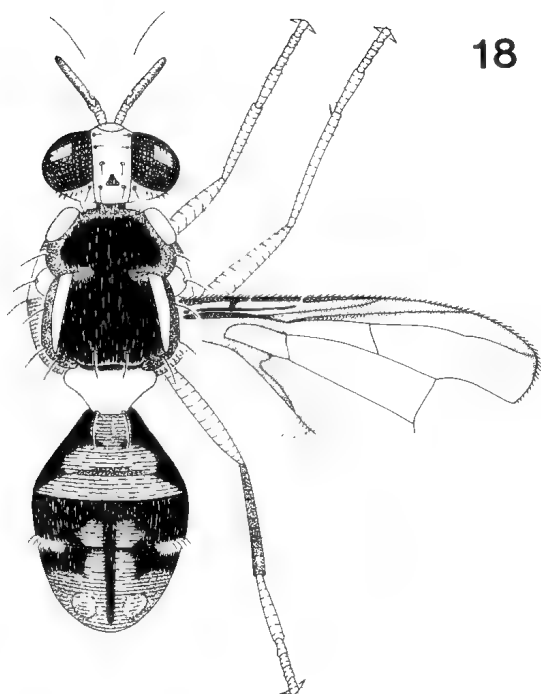


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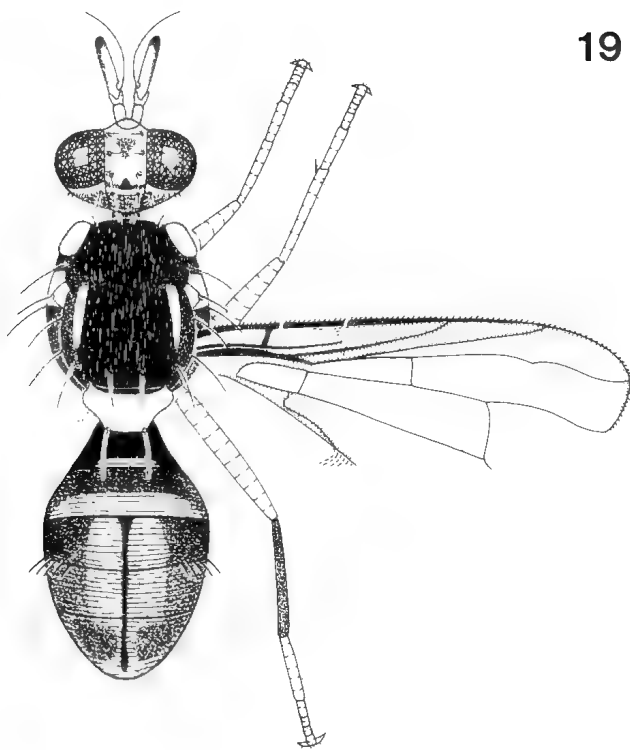


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FIG. 16. *Bactrocera* (*Bactrocera*) *aemula* n. sp., adult male (x8). FIG. 17. *Bactrocera* (*Bactrocera*) *consectorata* n. sp., adult male (x7).

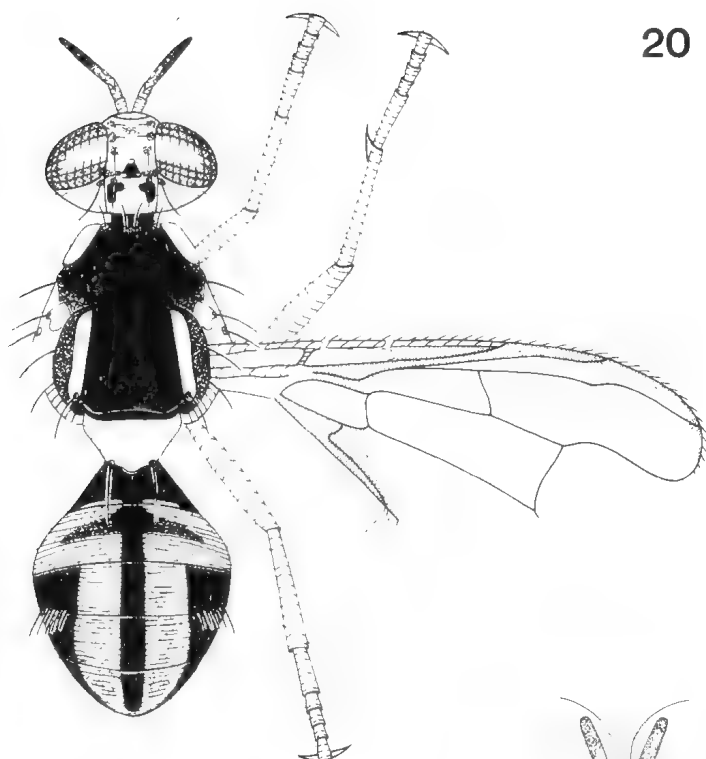


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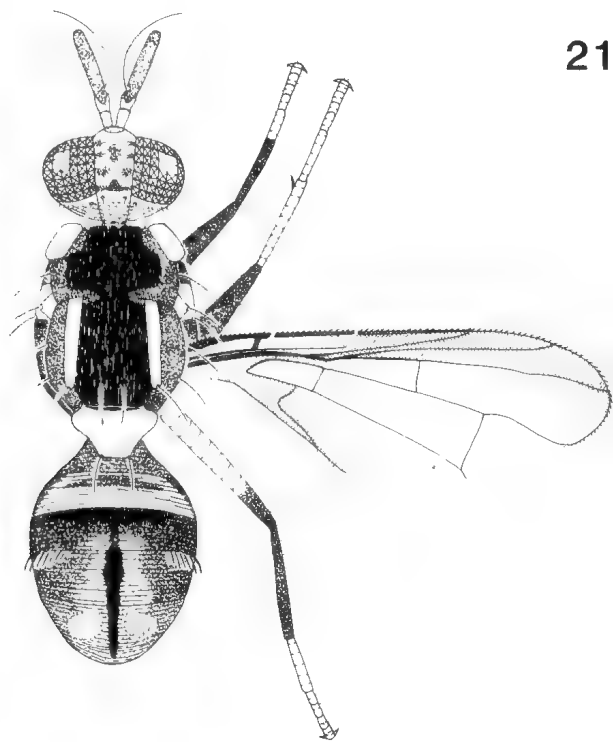


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FIG. 18. *Bactrocera* (*Bactrocera*) *fuliginus* (Drew and Hancock), adult male (x9). FIG. 19. *Bactrocera* (*Bactrocera*) *inconstans* n. sp., adult male (x10).

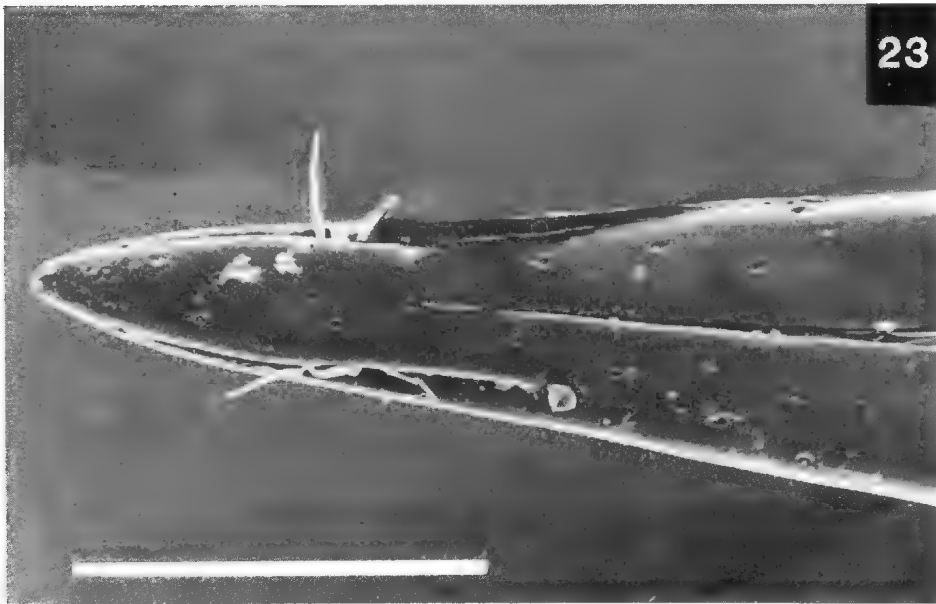
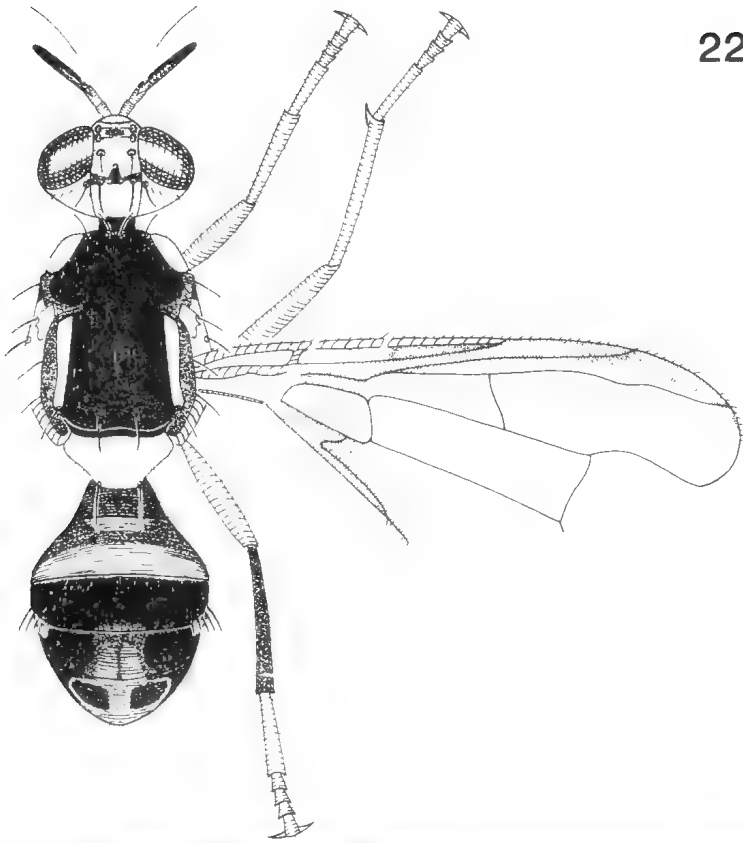


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FIG. 20. *Bactrocera* (*Bactrocera*) *indecora* (Drew), adult male (x10). FIG. 21. *Bactrocera* (*Bactrocera*) *laticosta* n. sp., adult male (x8).



FIGS 22–23. *Bactrocera* (*Bactrocera*) *trivialis* (Drew): 22, adult male (x11); 23, apex of aculeus (scale 0.1 mm).

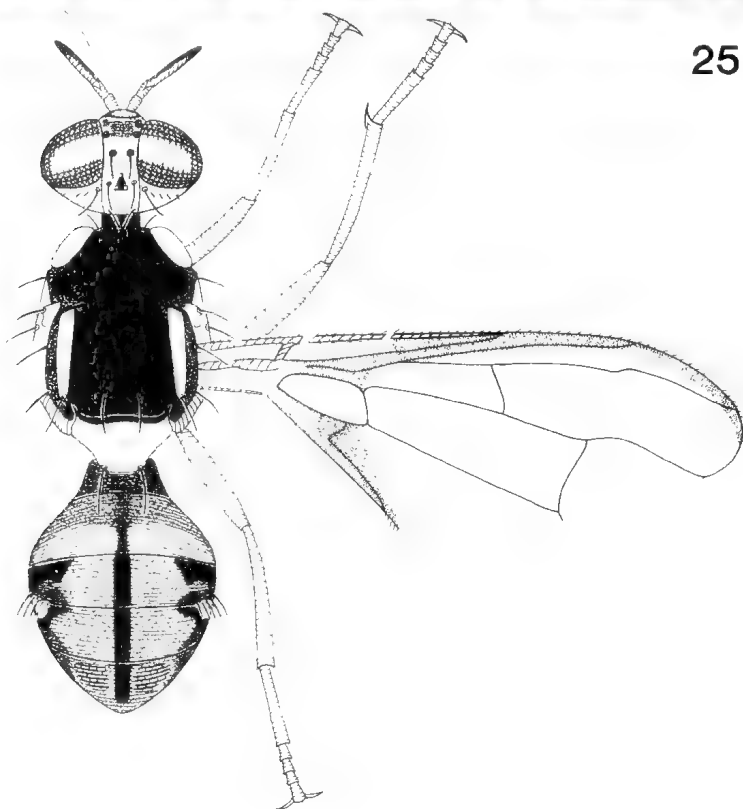
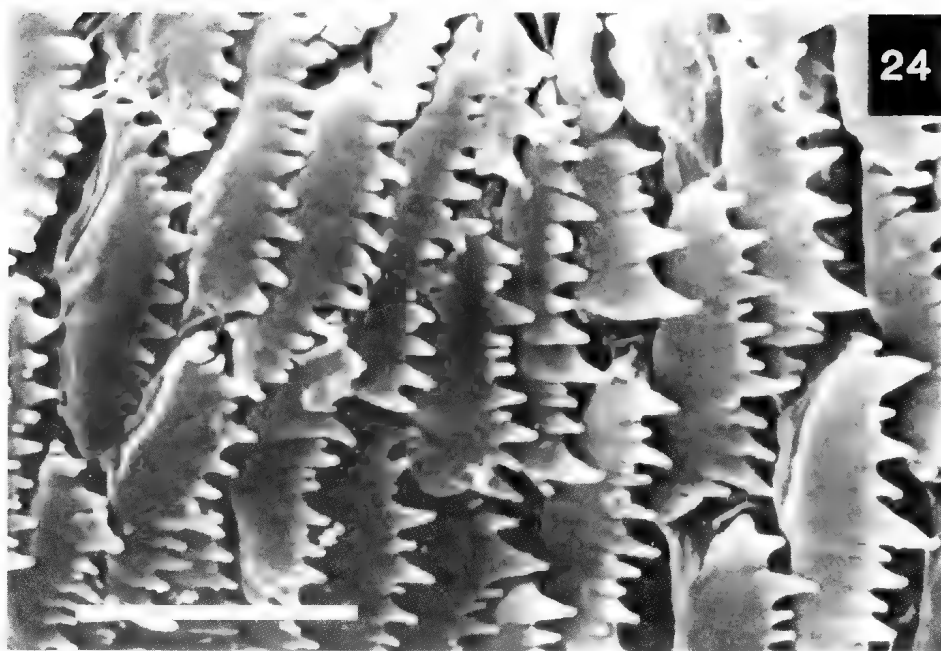
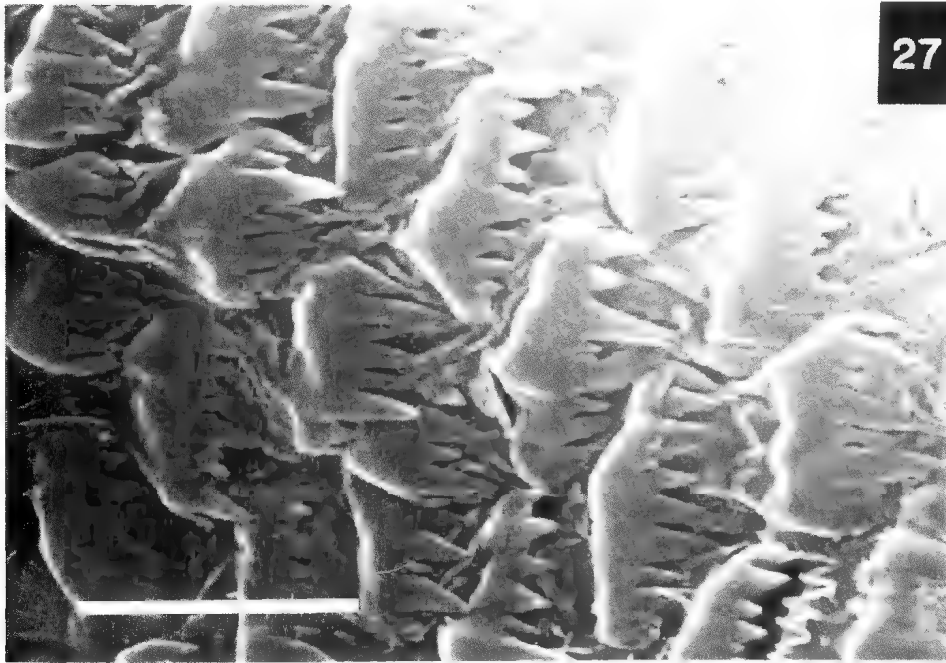
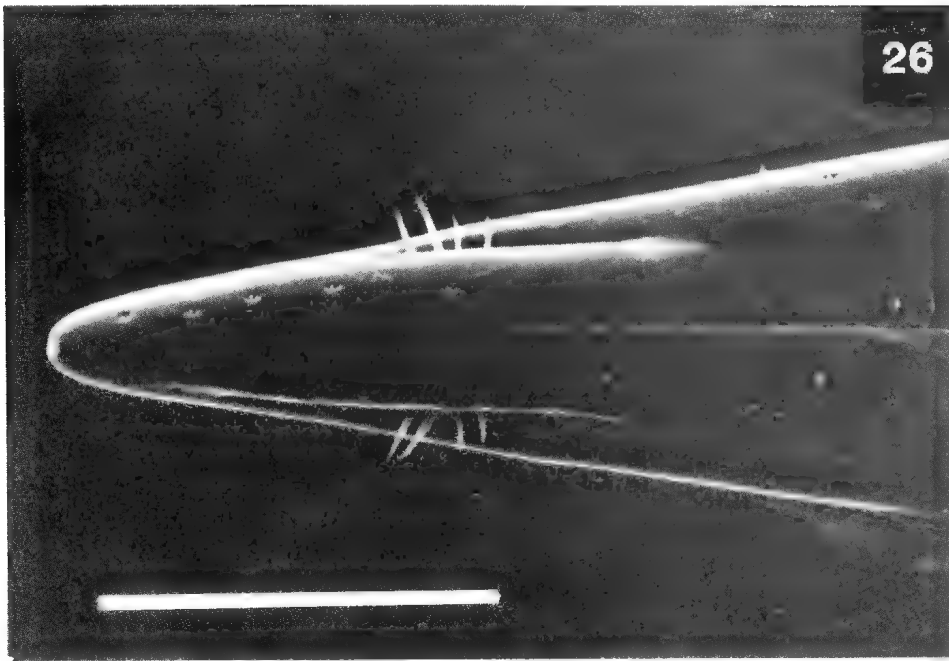
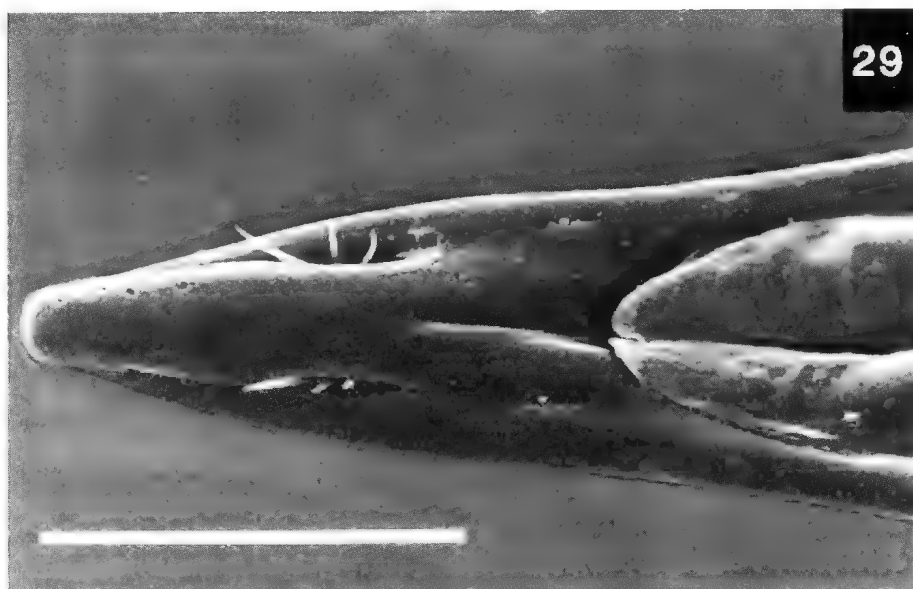
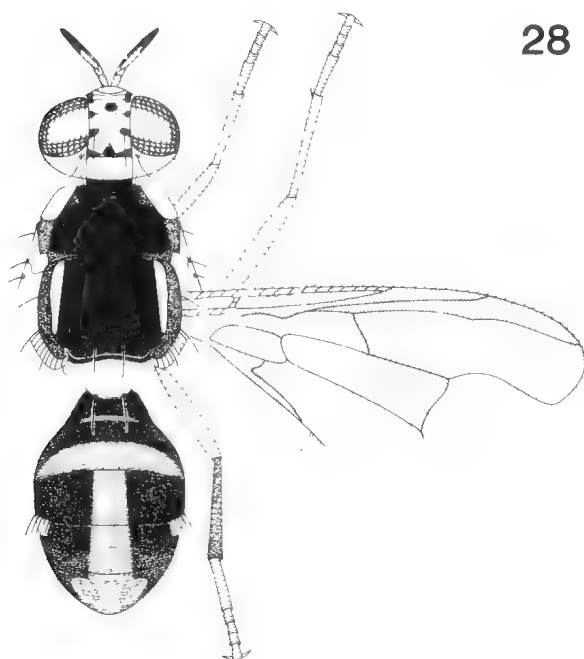


FIG. 24. *Bactrocera* (*Bactrocera*) *trivialis* (Drew), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 25. *Bactrocera* (*Bactrocera*) *vulgaris* (Drew), adult male (x11).



FIGS 26–27. *Bactrocera (Bactrocera) vulgaris* (Drew): 26, apex of aculeus (scale 0.1mm); 27, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 28–29. *Bactrocera* (*Bactrocera*) *alyxiae* (May): 28, adult male (x9); 29, apex of aculeus (scale 0.1 mm).

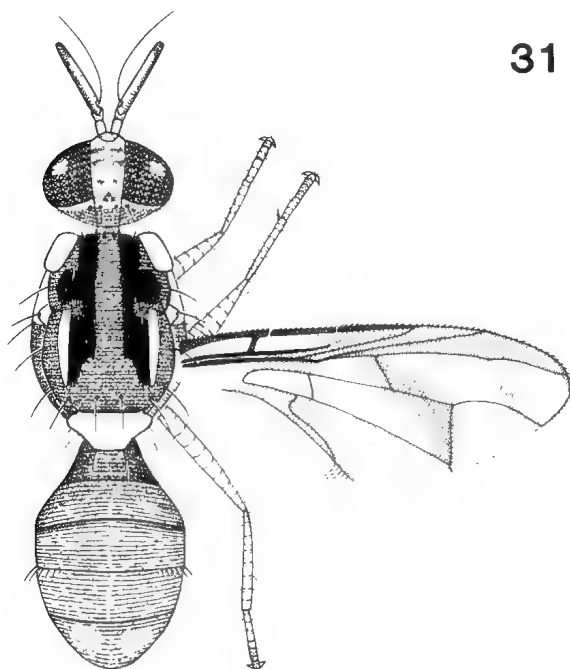
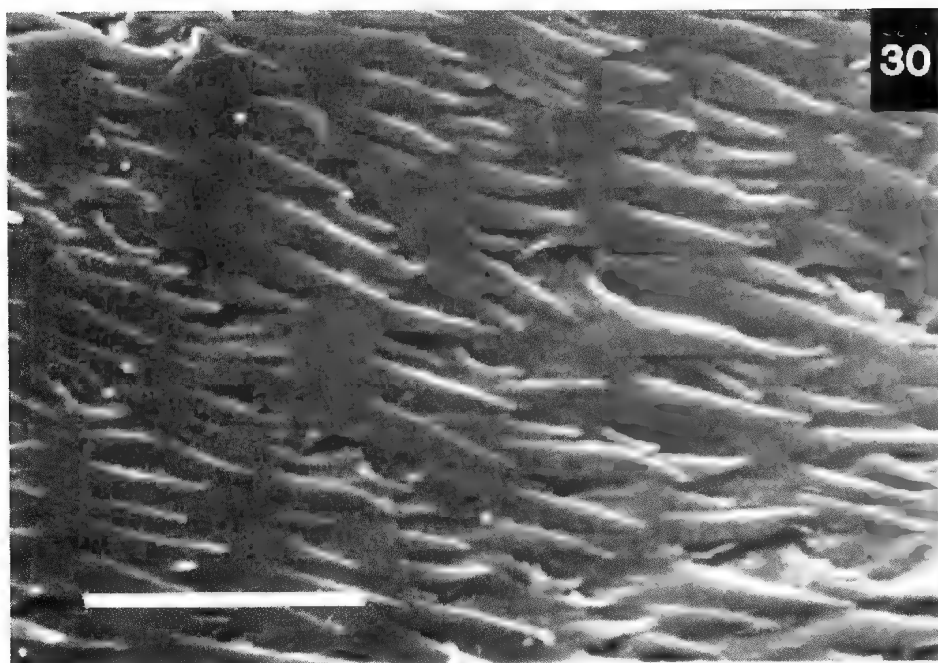
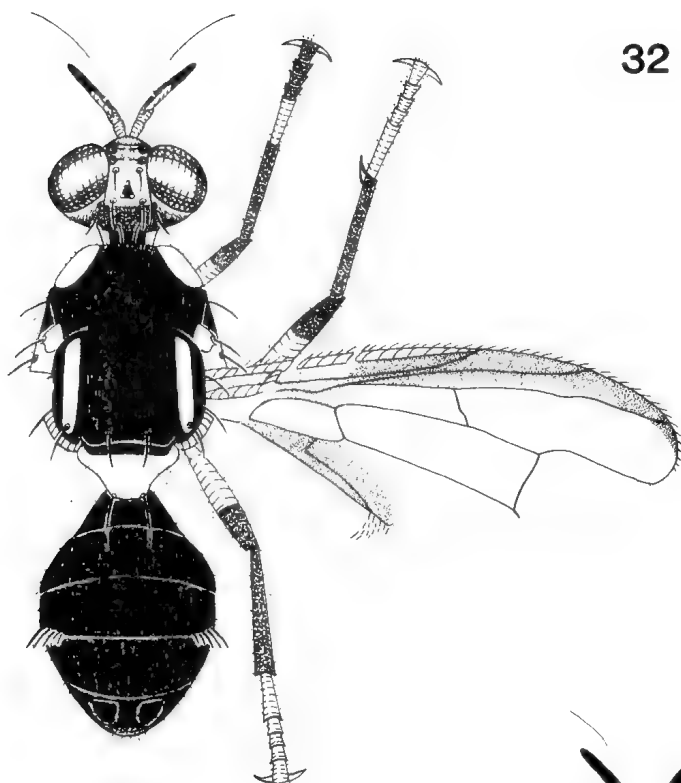
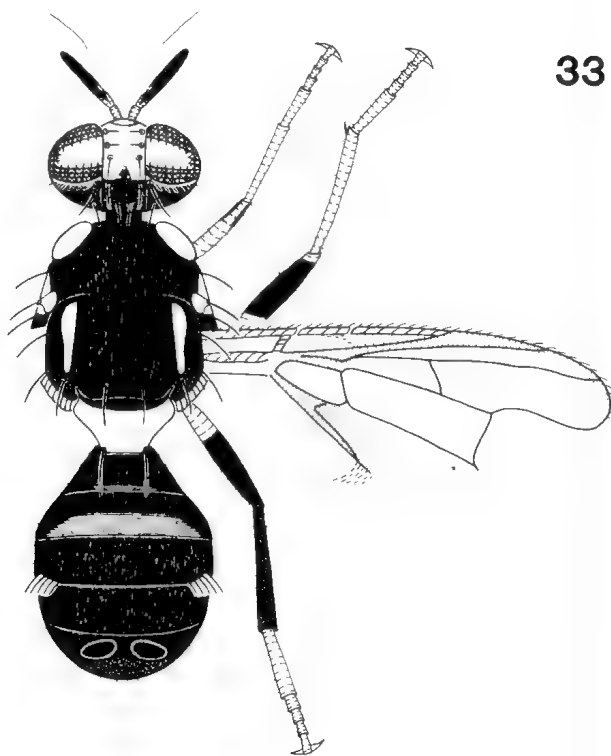


FIG. 30. *Bactrocera* (*Bactrocera*) *alyxiae* (May), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 31. *Bactrocera* (*Bactrocera*) *repanda* n. sp., adult male (x9).

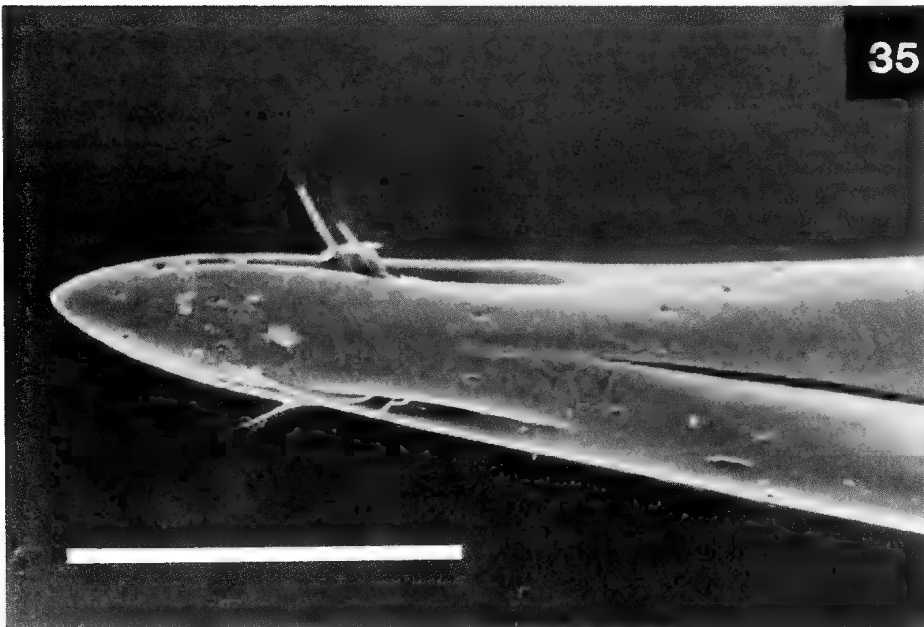
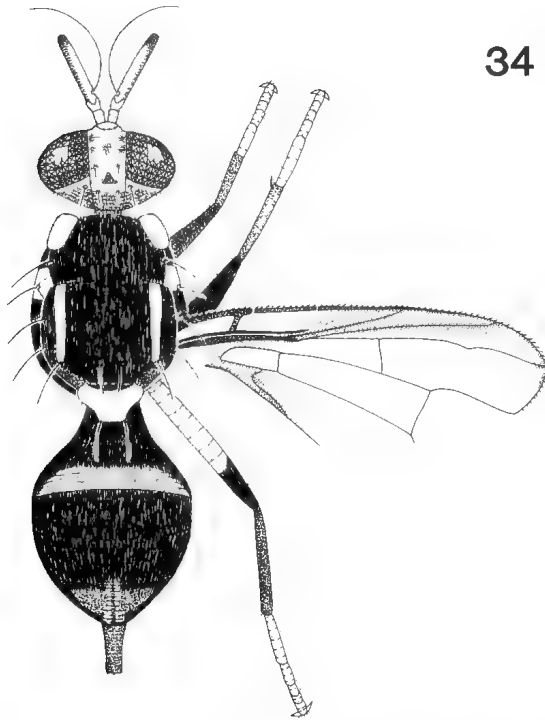


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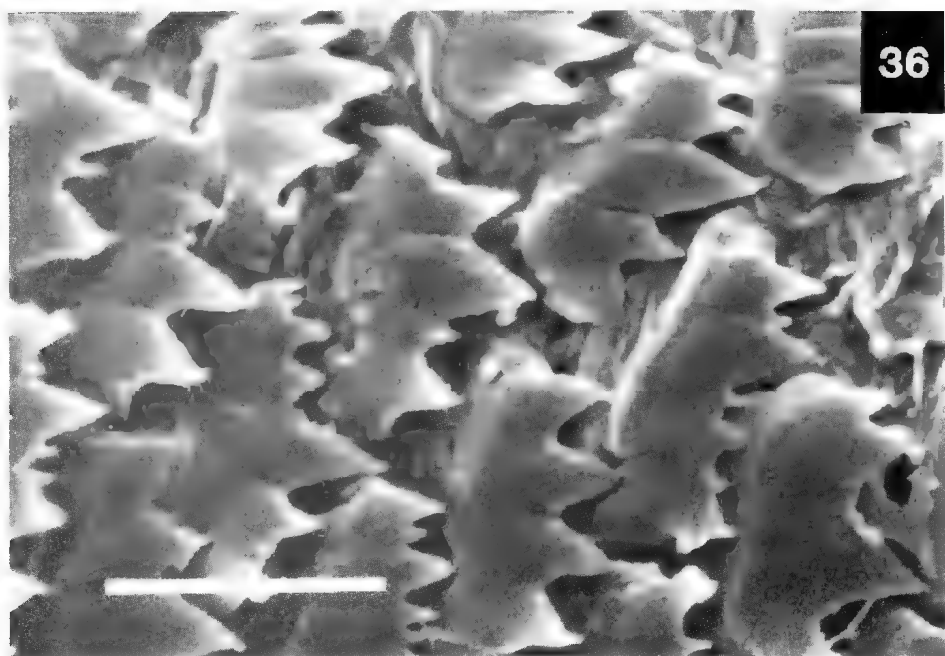


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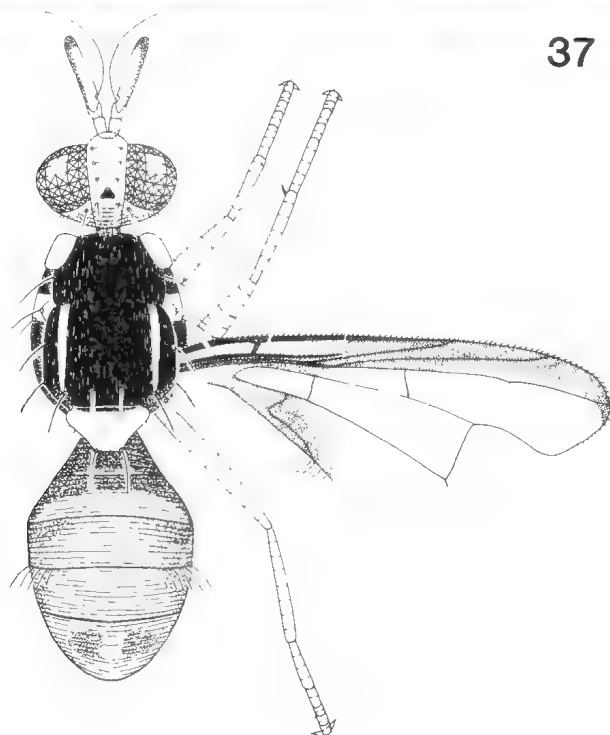
FIG. 32. *Bactrocera* (*Bactrocera*) *anthracina* (Drew), adult male (x9). FIG. 33. *Bactrocera* (*Bactrocera*) *aterrima* (Drew), adult male (x8).



FIGS 34–35. *Bactrocera* (*Bactrocera*) *terminaliae* n. sp.: 34, adult female (x8); 35, apex of aculeus (scale 0.1 mm).

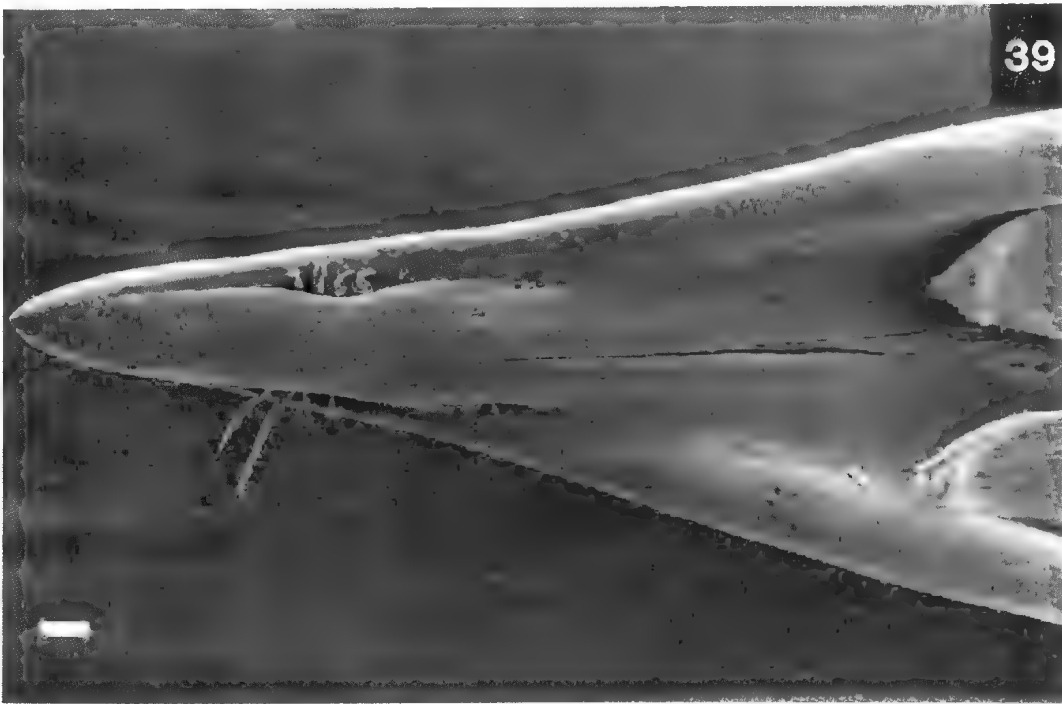
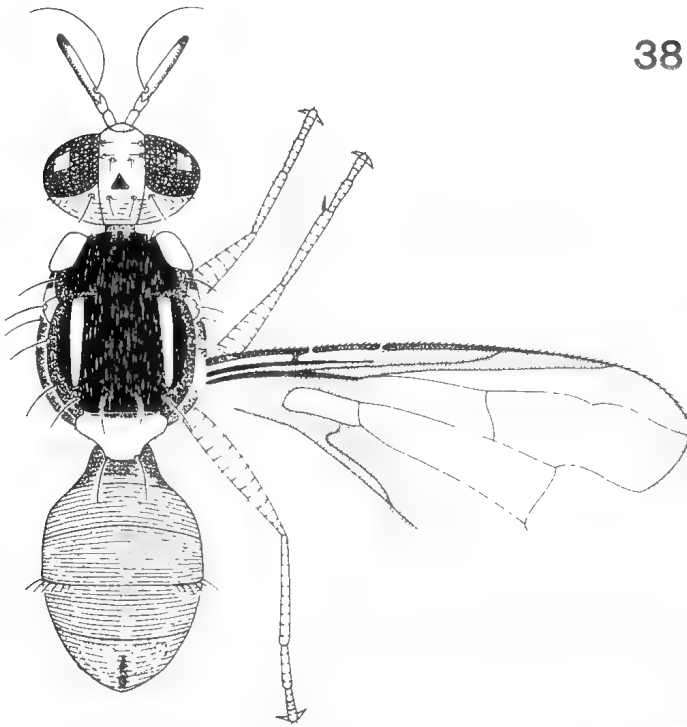


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FIG. 36. *Bactrocera (Bactrocera) terminaliae* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 37. *Bactrocera (Bactrocera) assita* n. sp., adult male (x10).



FIGS 38–39. *Bactrocera* (*Bactrocera*) *brevistriata* (Drew): 38, adult male (x10); 39, apex of aculeus (scale 0.01 mm).

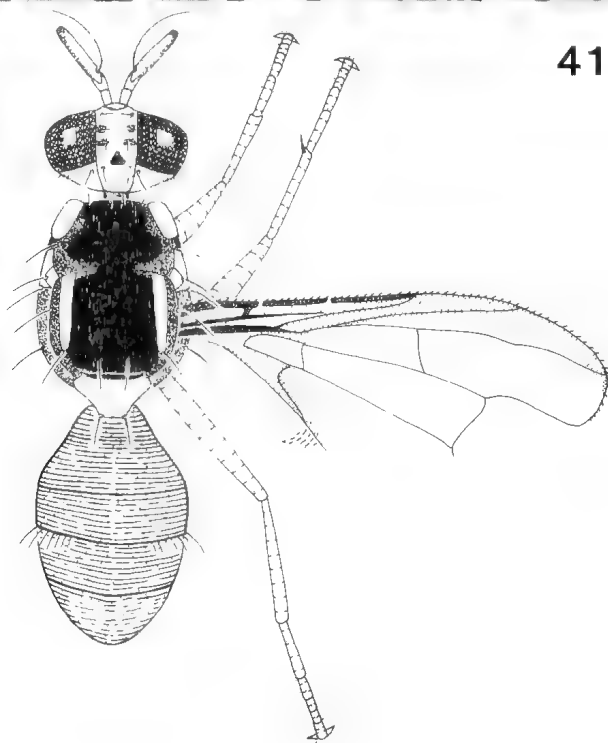
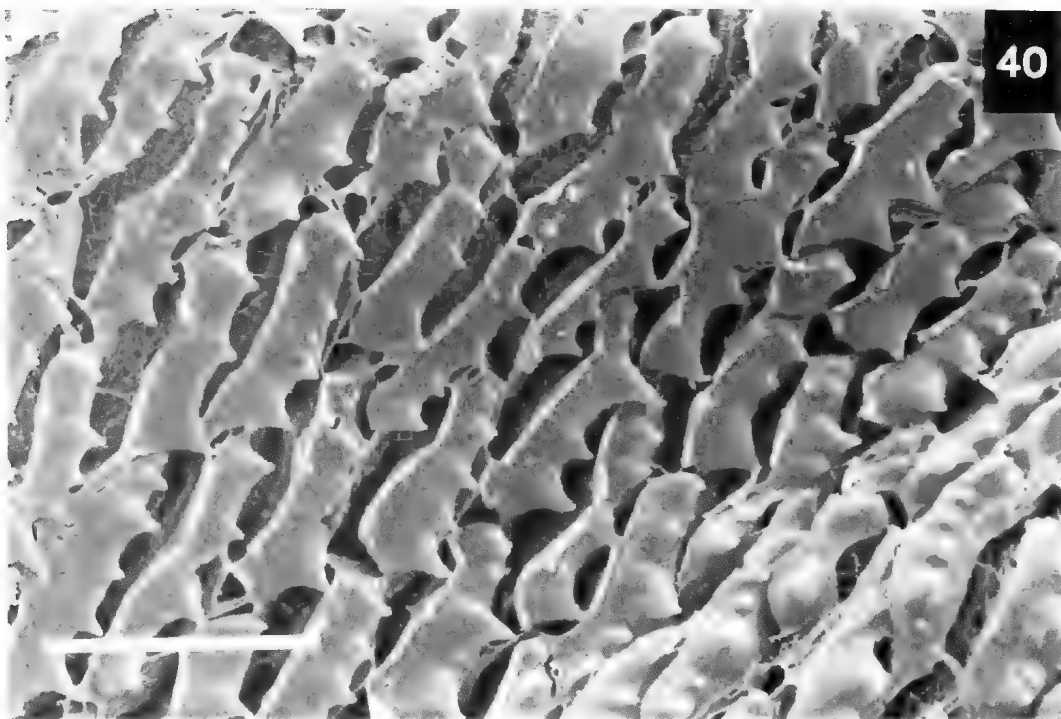
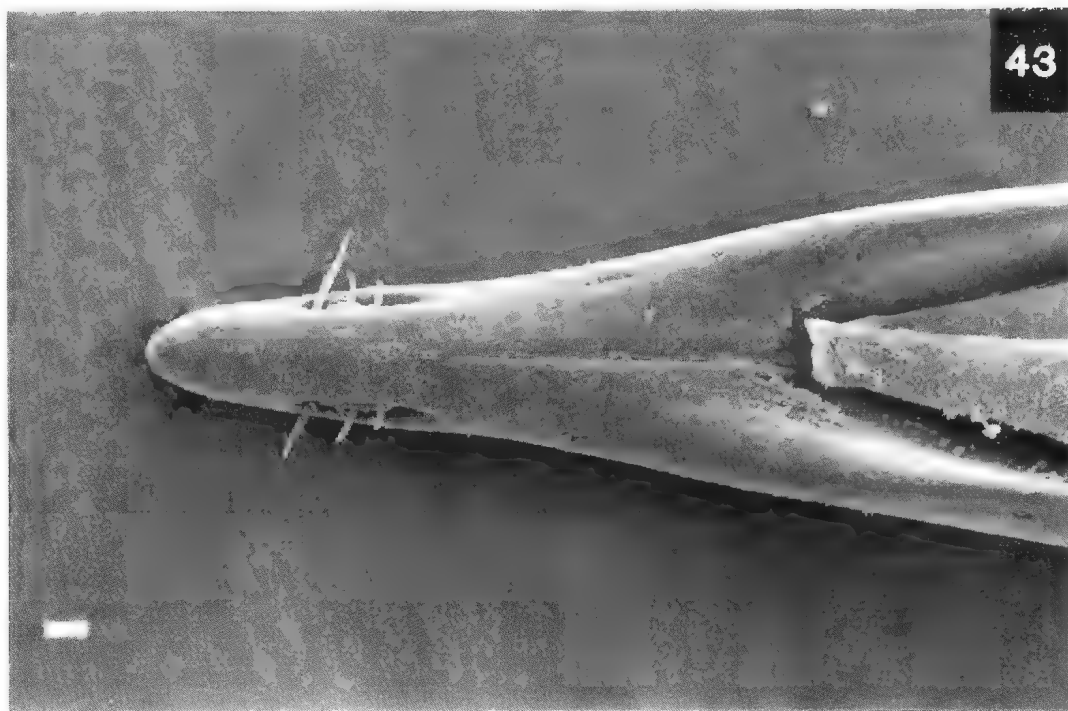
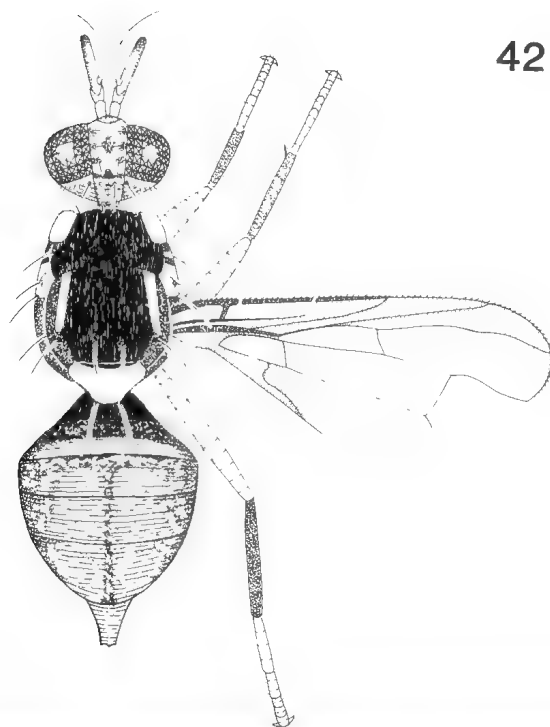


FIG. 40. *Bactrocera* (*Bactrocera*) *brevistriata* (Drew), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 41. *Bactrocera* (*Bactrocera*) *circumusae* n. sp., adult male (x8).



FIGS 42-43. *Bactrocera* (*Bactrocera*) *commina* n. sp.: 42, adult female (x10); 43, apex of aculeus (scale 0.01 mm).

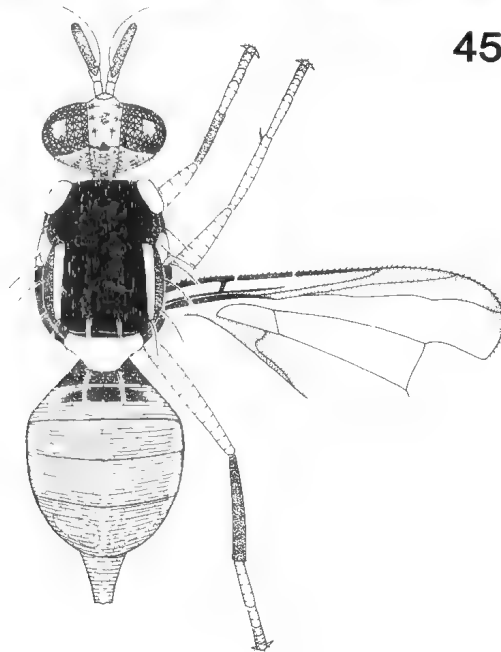
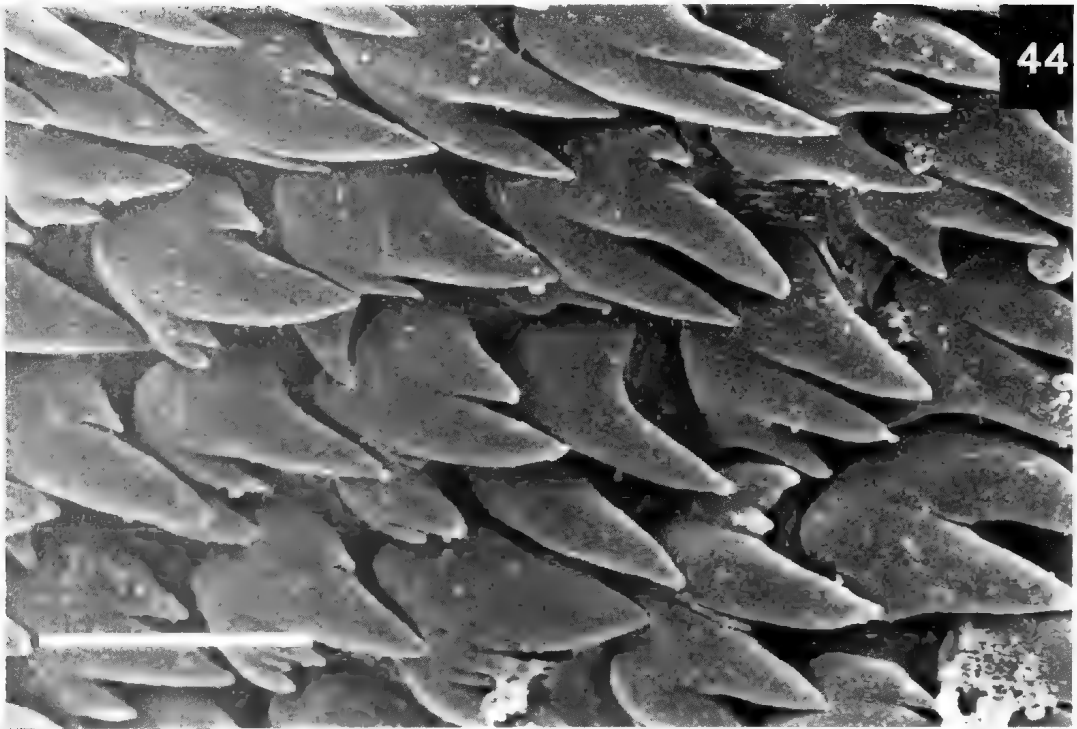
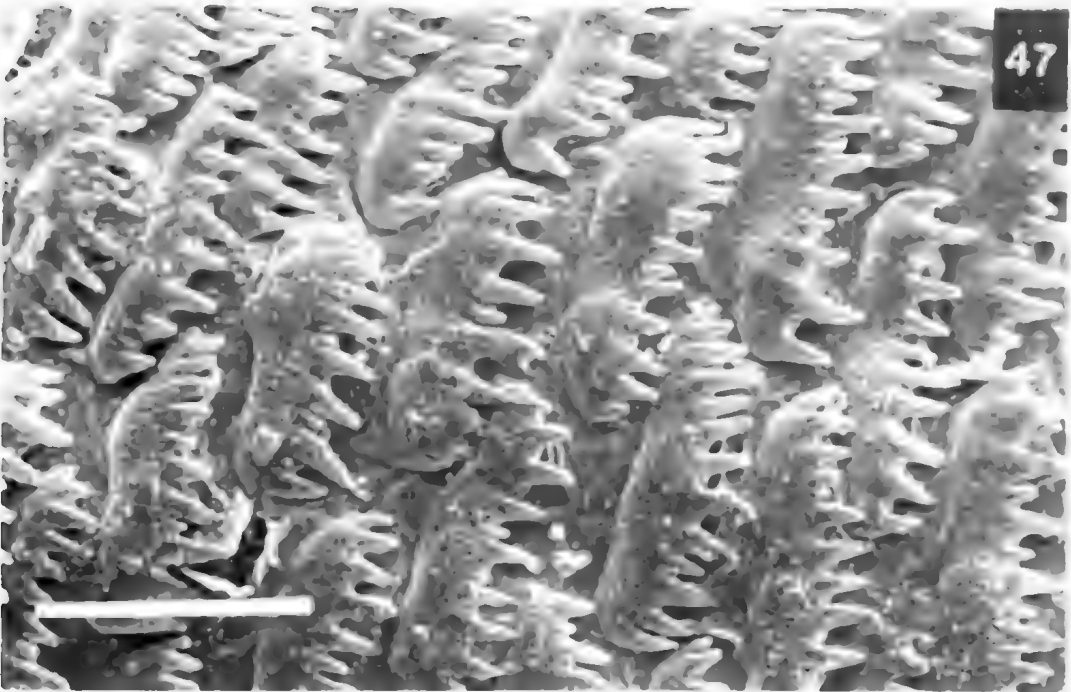
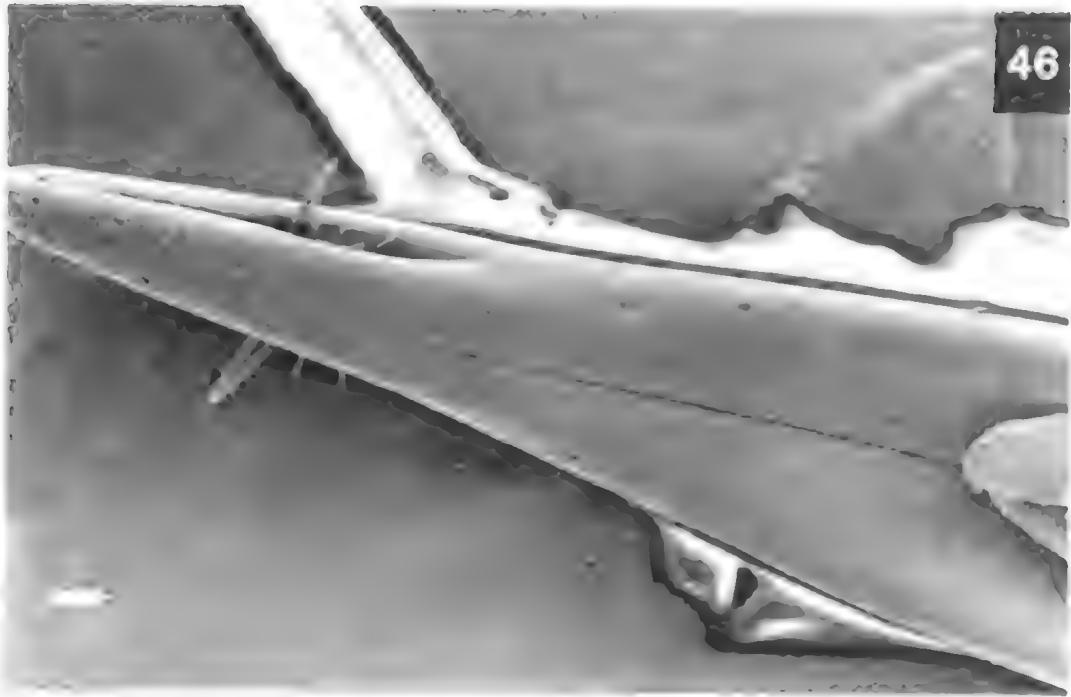
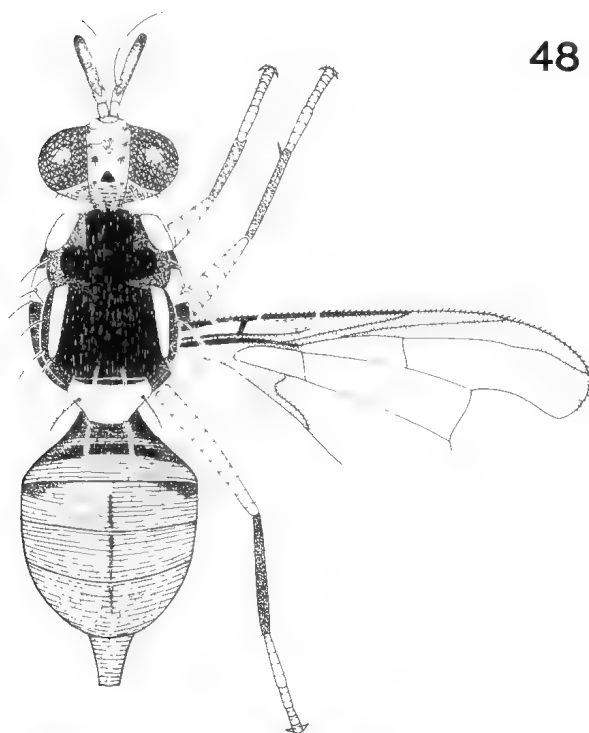


FIG. 44. *Bactrocera (Bactrocera) commina* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 45. *Bactrocera (Bactrocera) contermina* n. sp., adult female (x7).



FIGS 46–47. *Bactrocera* (*Bactrocera*) *contermina* n. sp.: 46, apex of aculeus (scale 0.01 mm); 47, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 48–49. *Bactrocera* (*Bactrocera*) *contigua* n. sp.: 48, adult female (x7); 49, apex of aculeus (scale 0.01 mm).

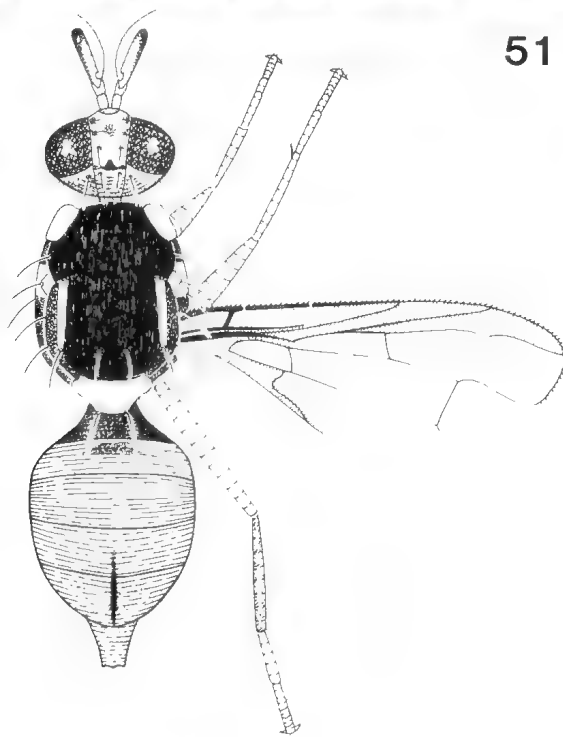
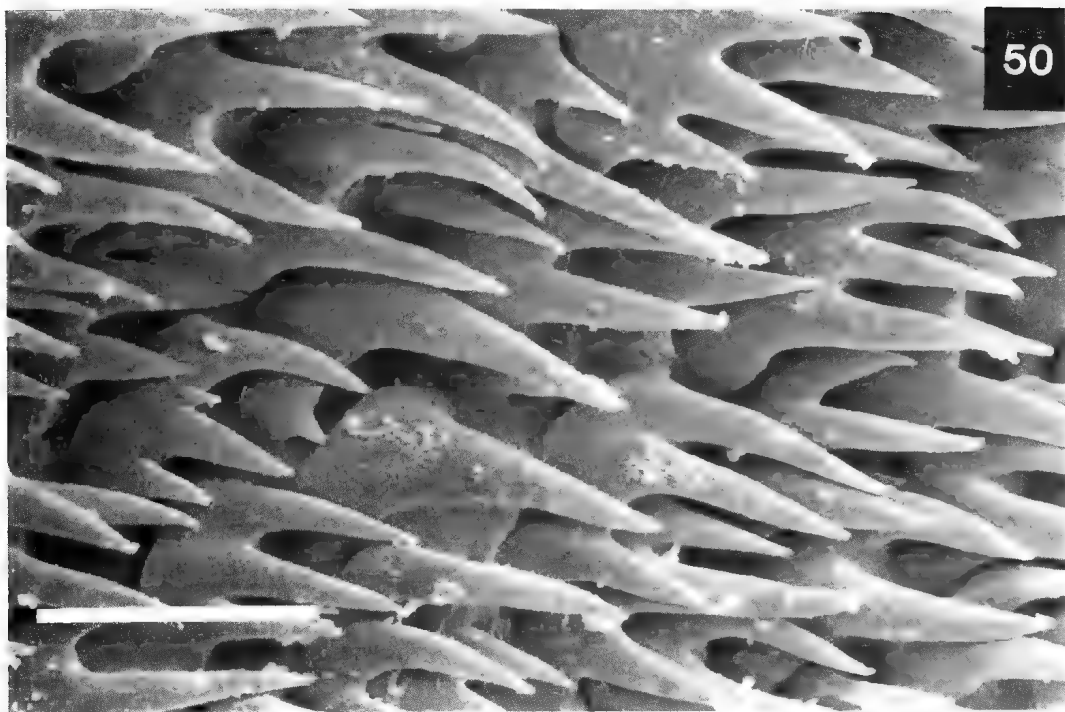
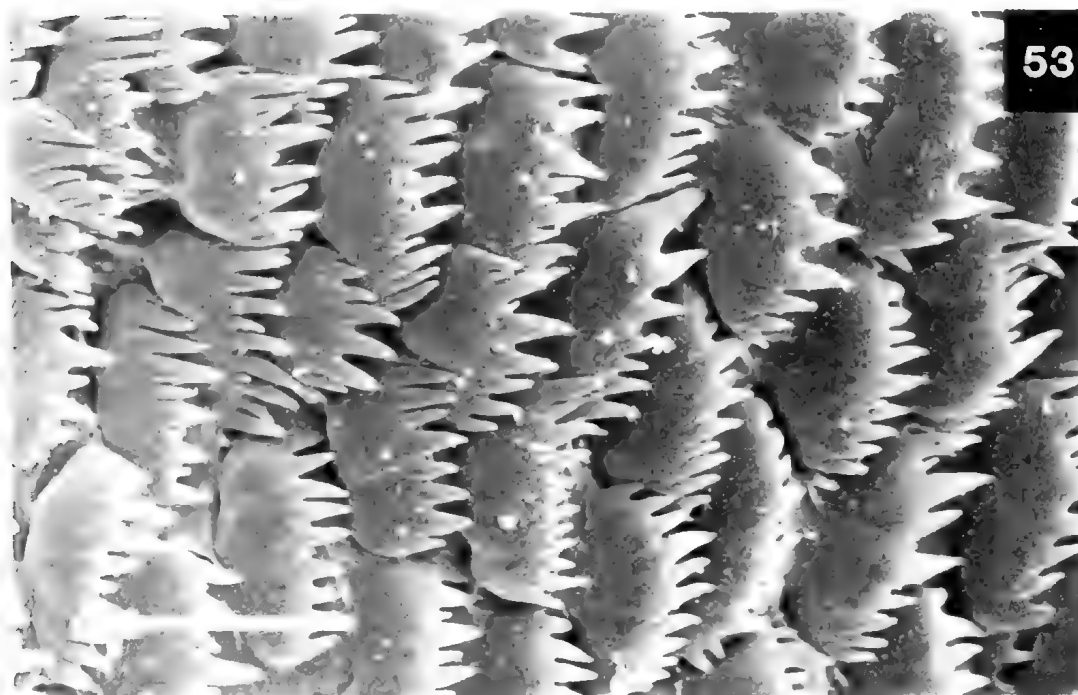
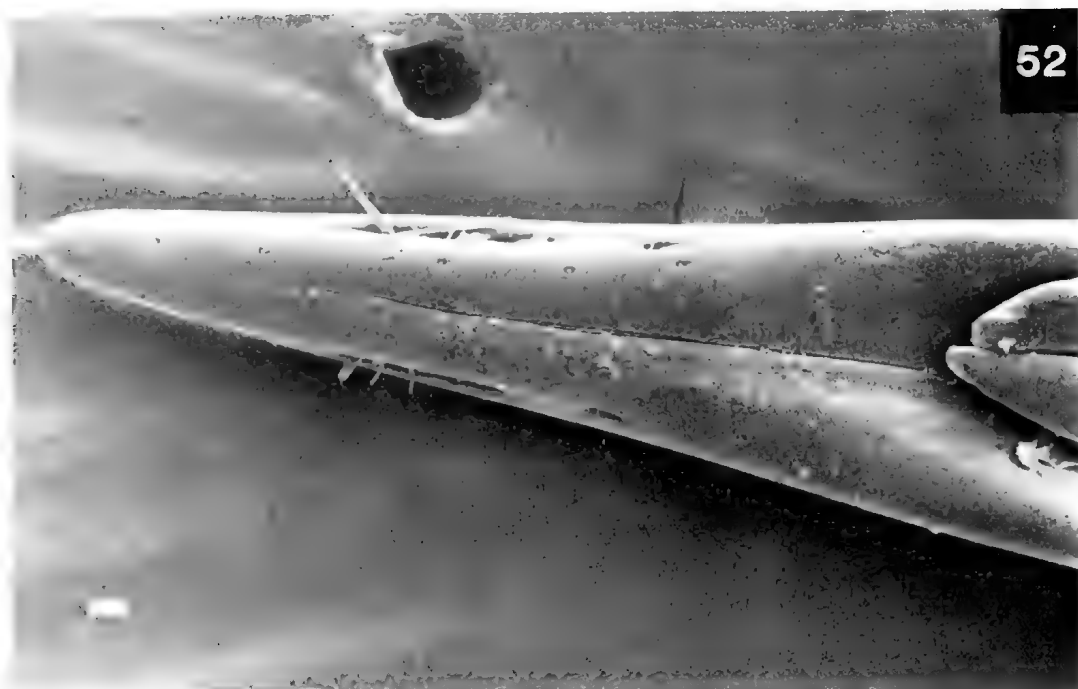
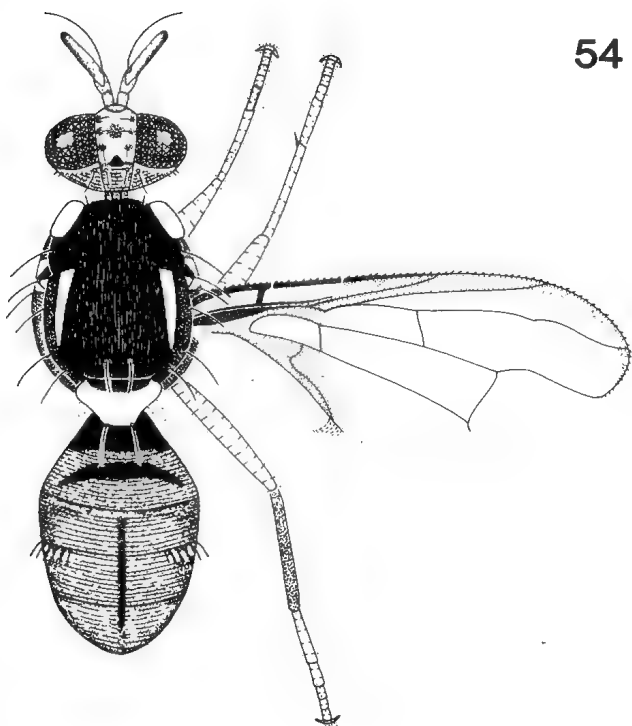


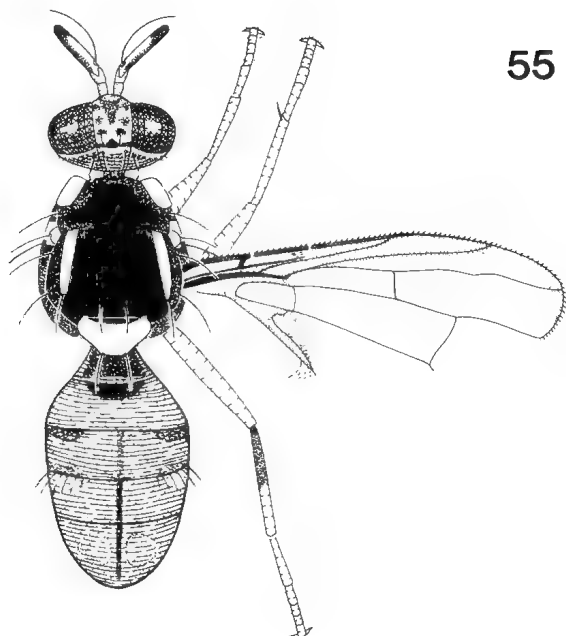
FIG. 50. *Bactrocera* (*Bactrocera*) *contigua* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 51. *Bactrocera* (*Bactrocera*) *finitima* n. sp., adult female (x7).



FIGS 52–53. *Bactrocera* (*Bactrocera*) *finitima* n. sp.: 52, apex of aculeus (scale 0.01 mm); 53, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

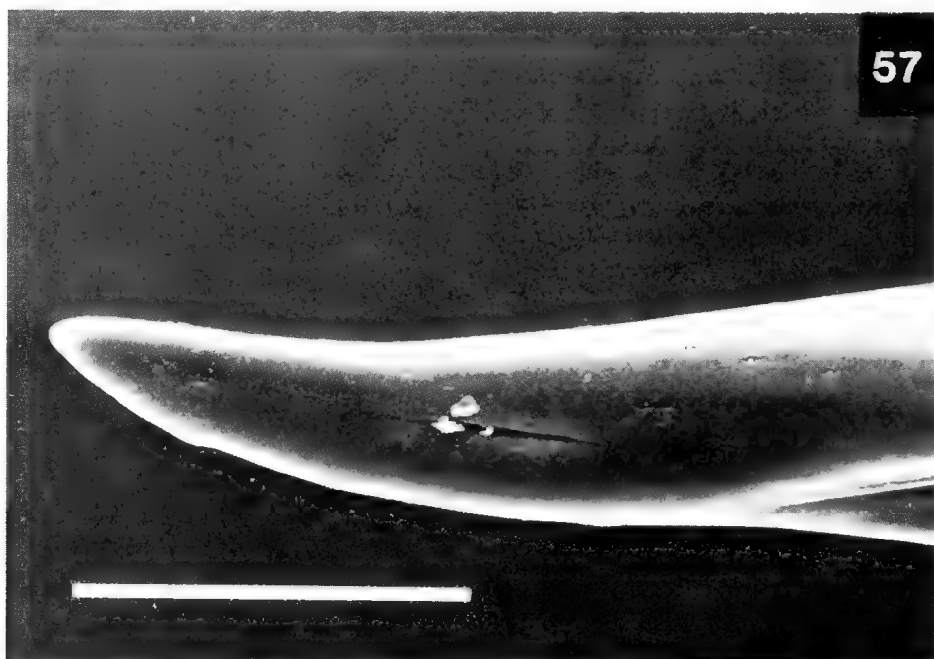
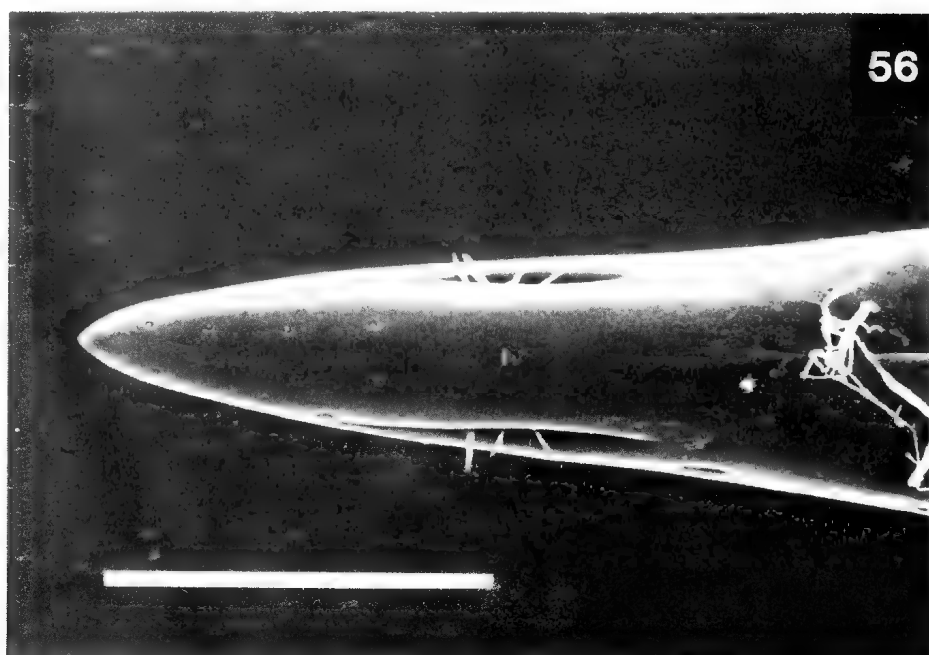


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FIG. 54. *Bactrocera* (*Bactrocera*) *robertsi* n. sp., adult male (x8). FIG. 55. *Bactrocera* (*Bactrocera*) *tinomiscii* n. sp., adult male (x7).



FIGS 56-57. *Bactrocera* (*Bactrocera*) *tinomiscii* n. sp.: 56, apex of aculeus dorsal view (scale 0.1 mm); 57, apex of aculeus lateral view (scale 0.1 mm).

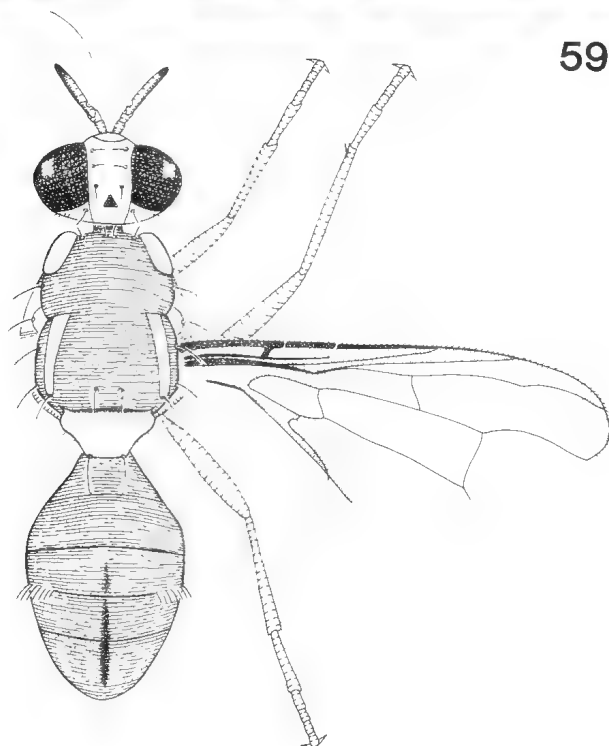
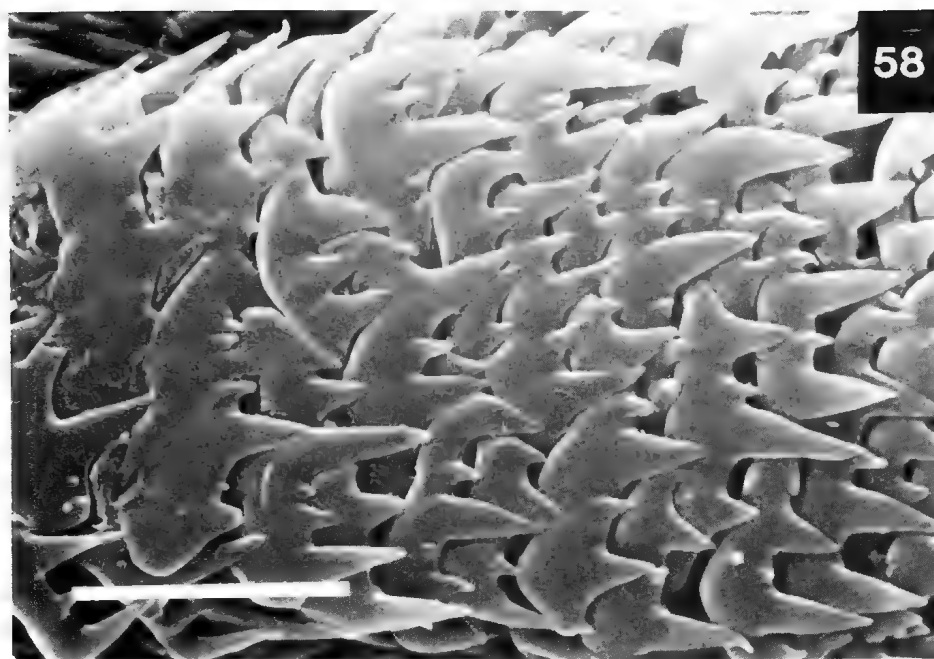
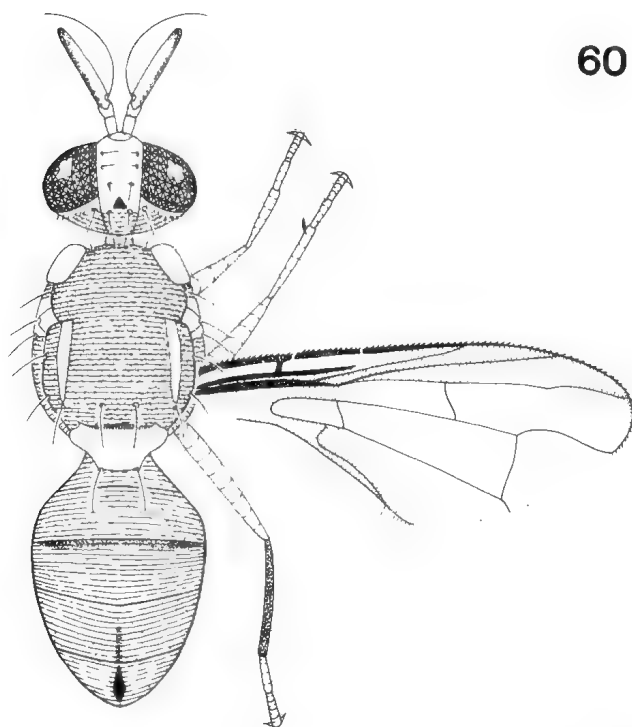
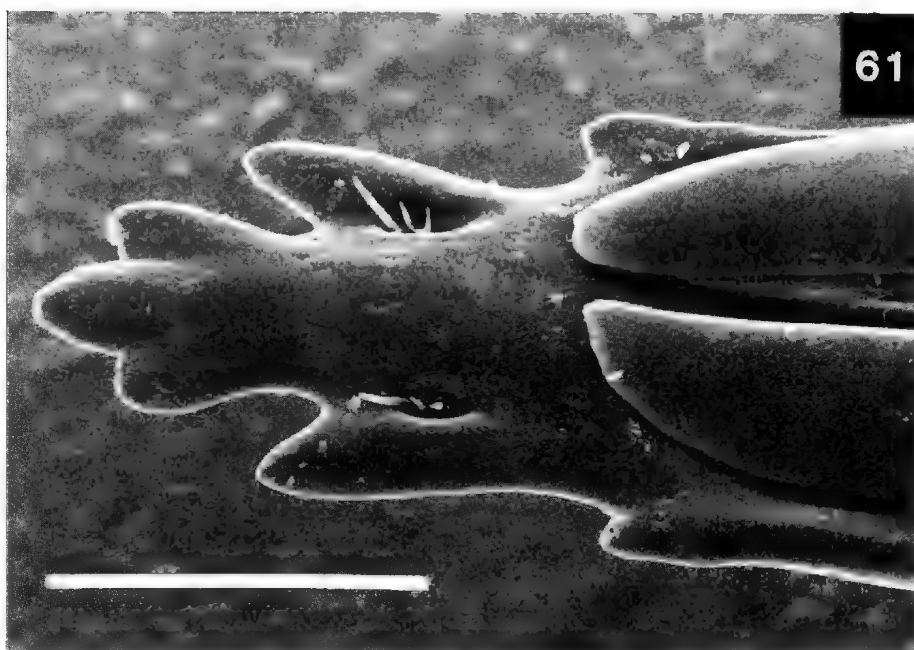


FIG. 58. *Bactrocera* (*Bactrocera*) *tinomiscii* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 59. *Bactrocera* (*Bactrocera*) *aeruginosa* (Drew and Hancock), adult male (x9).



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FIGS 60–61. *Bactrocera* (*Bactrocera*) *bidentata* (May): 60, adult male (x9); 61, apex of aculeus (scale 0.1 mm).

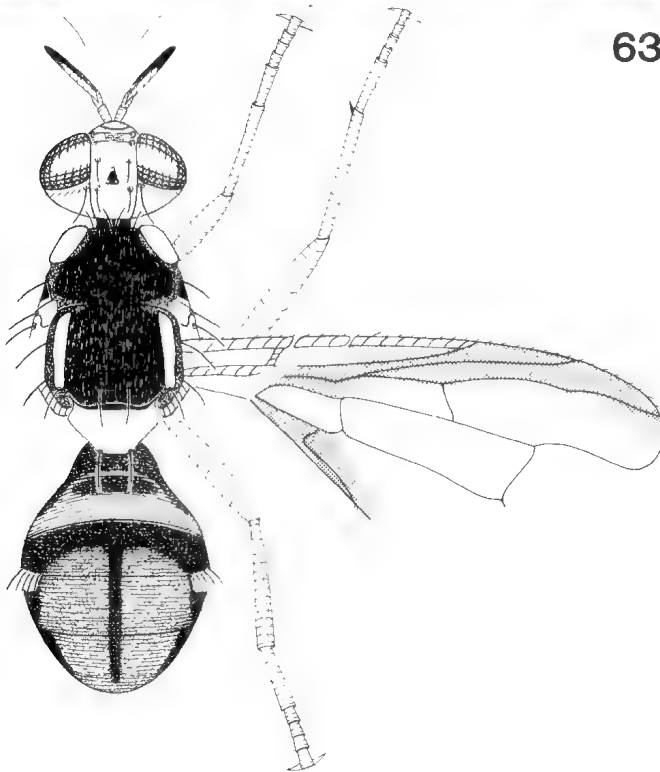
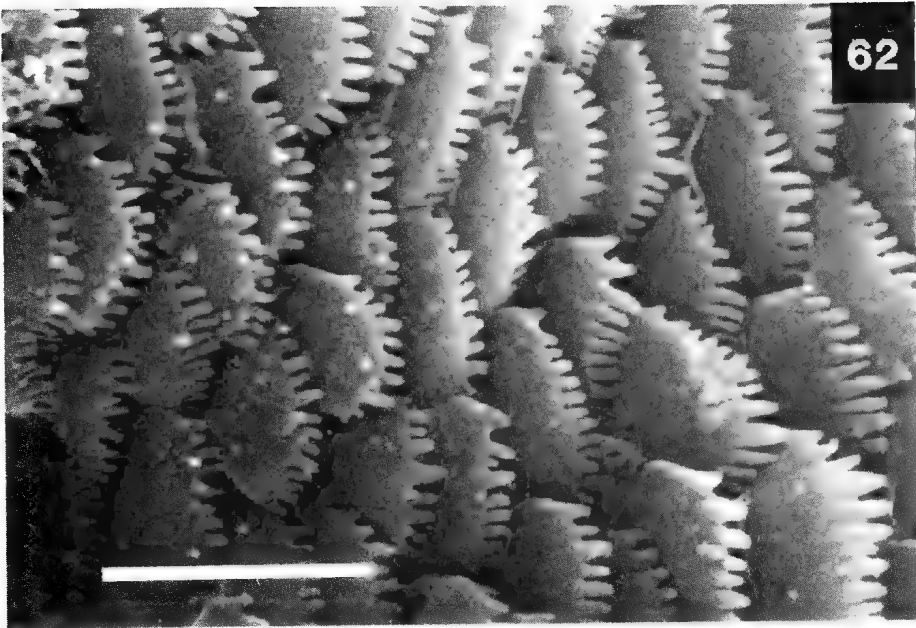
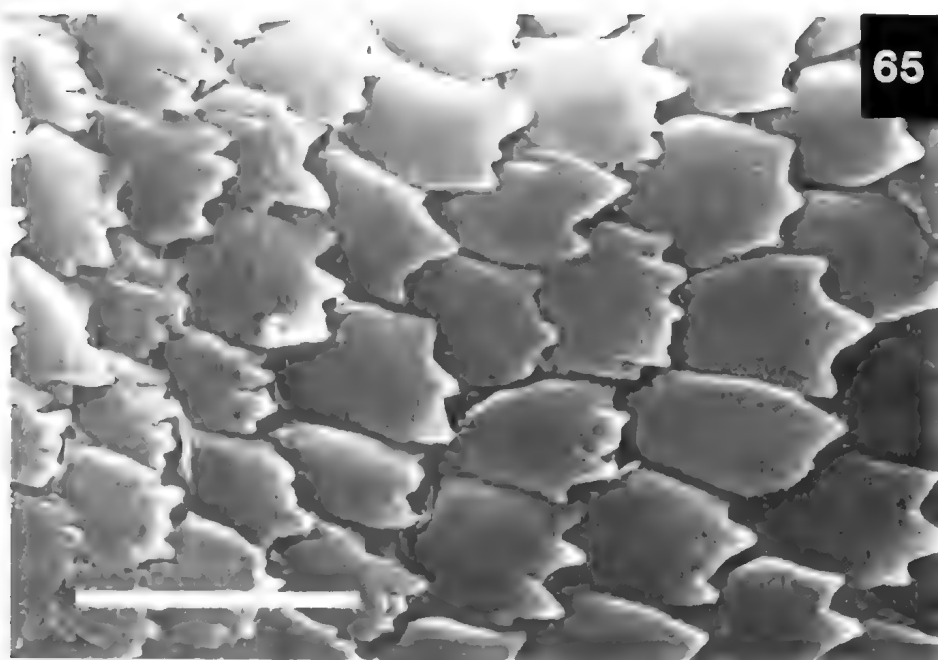
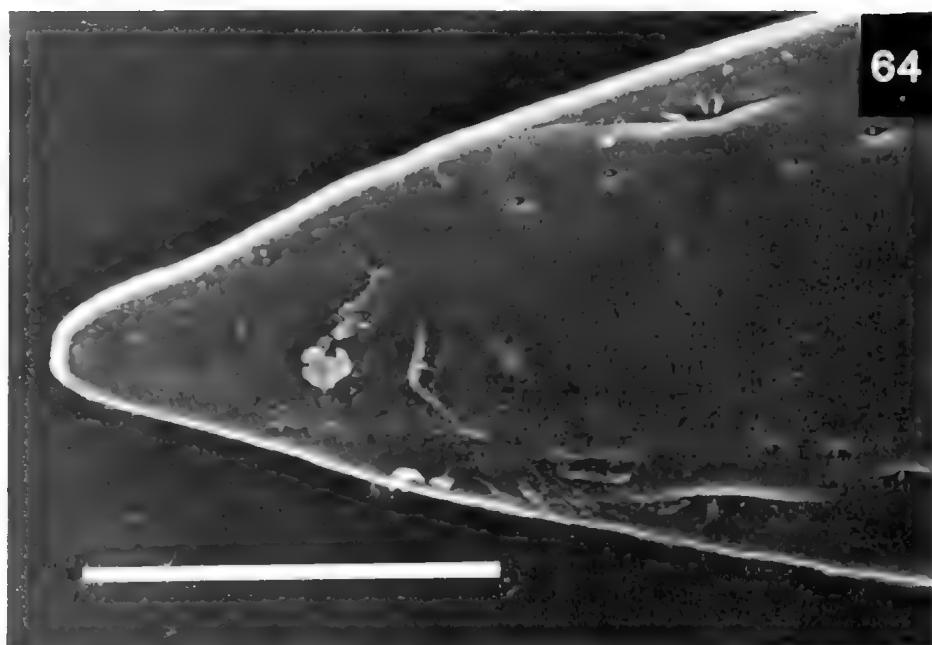
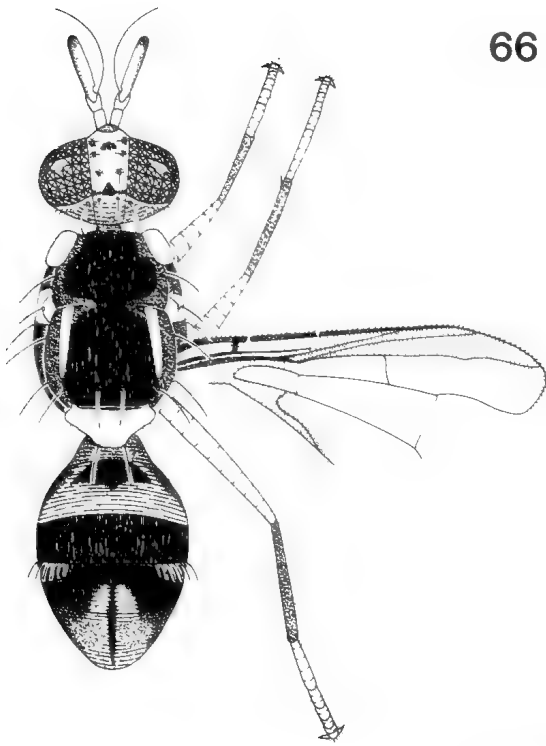


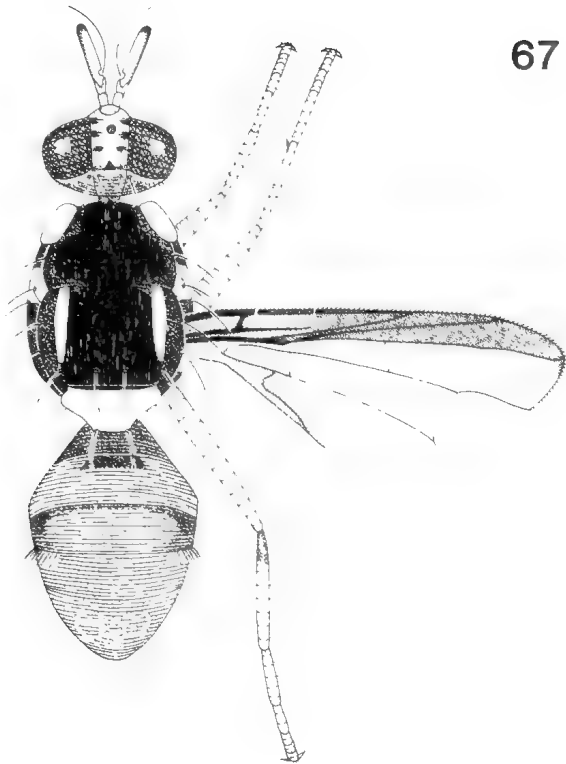
FIG. 62. *Bactrocera* (*Bactrocera*) *bidentata* (May), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 63. *Bactrocera* (*Bactrocera*) *bryoniae* (Tryon), adult male (x9).



FIGS 64–65. *Bactrocera* (*Bactrocera*) *bryoniae* (Tryon): 64, apex of aculeus (scale 0.1 mm); 65, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

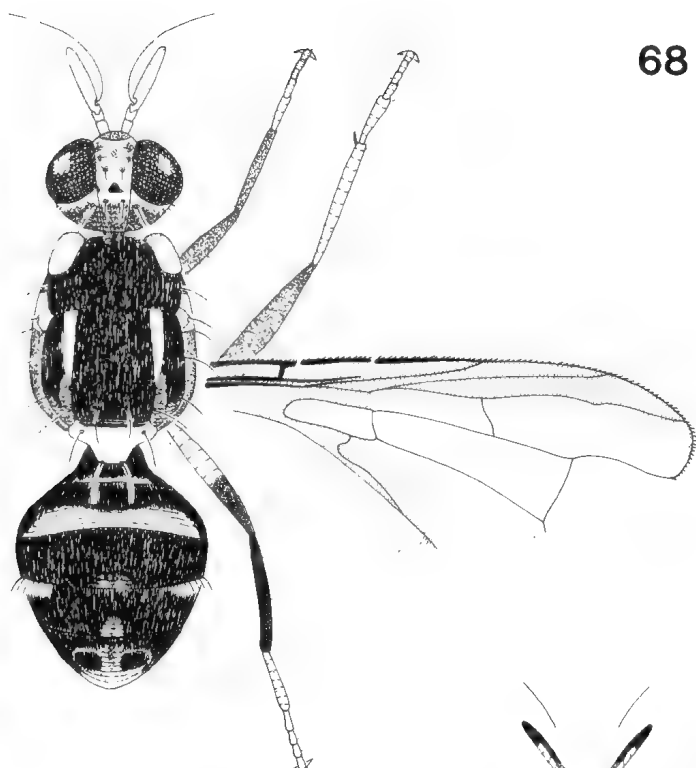


66

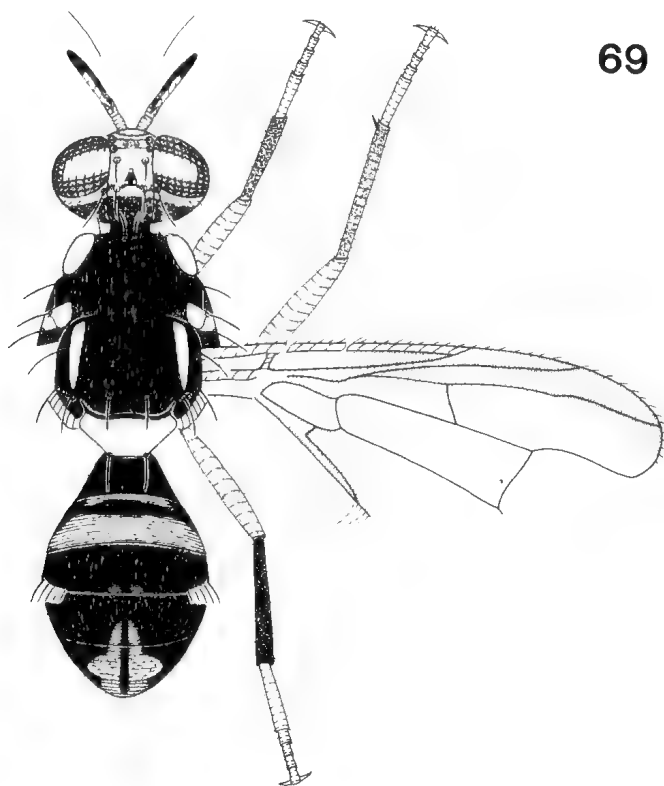


67

FIG. 66. *Bactrocera* (*Bactrocera*) *latissima* n. sp., adult male (x6). FIG. 67. *Bactrocera* (*Bactrocera*) *paramusae* n. sp., adult male (x8).

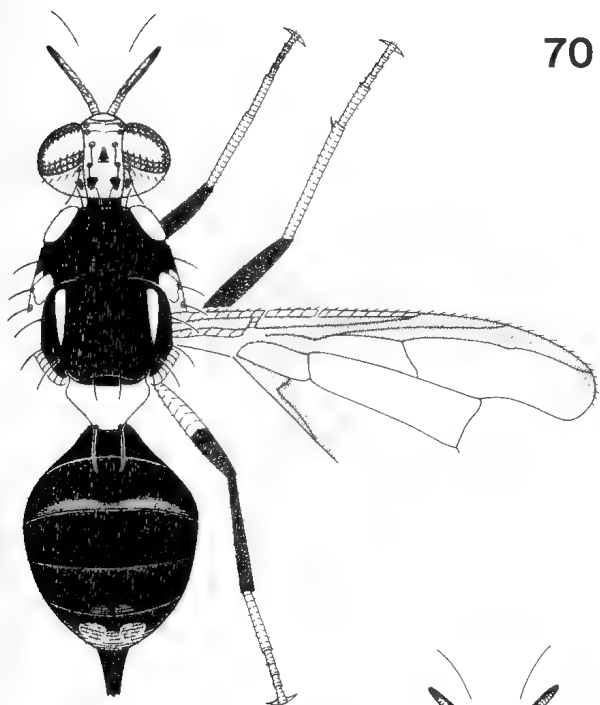


68

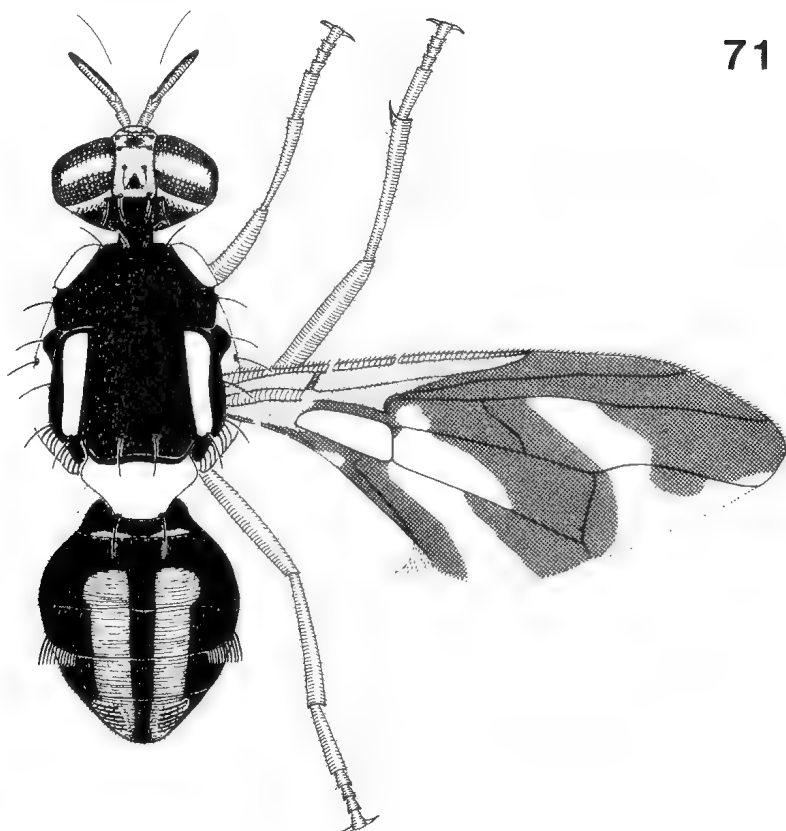


69

FIG. 68. *Bactrocera* (*Bactrocera*) *quadrisetosa* (Bezzi), adult male (x9). FIG. 69. *Bactrocera* (*Bactrocera*) *simulata* (Malloch), adult male (x9).

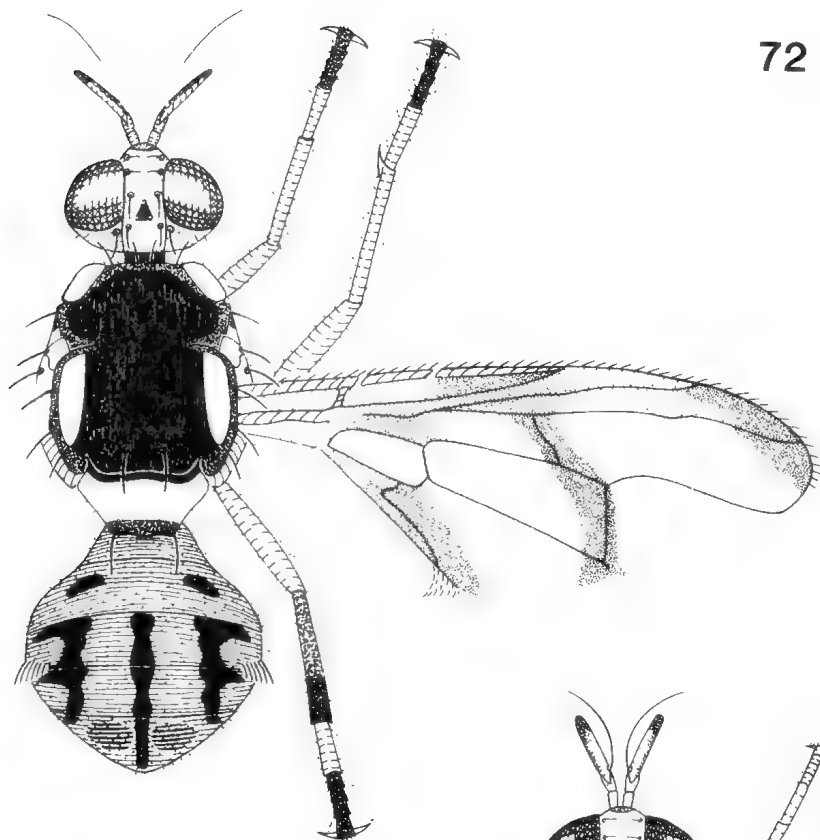


70

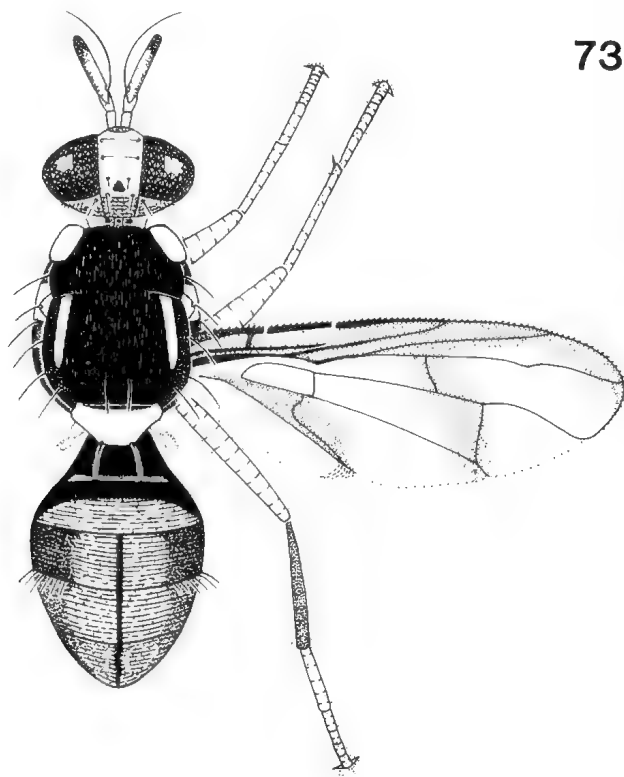


71

FIG. 70. *Bactrocera* (*Bactrocera*) *varipes* (Malloch), adult female (x7). FIG. 71. *Bactrocera* (*Bactrocera*) *ampla* (Drew), adult male (x9).

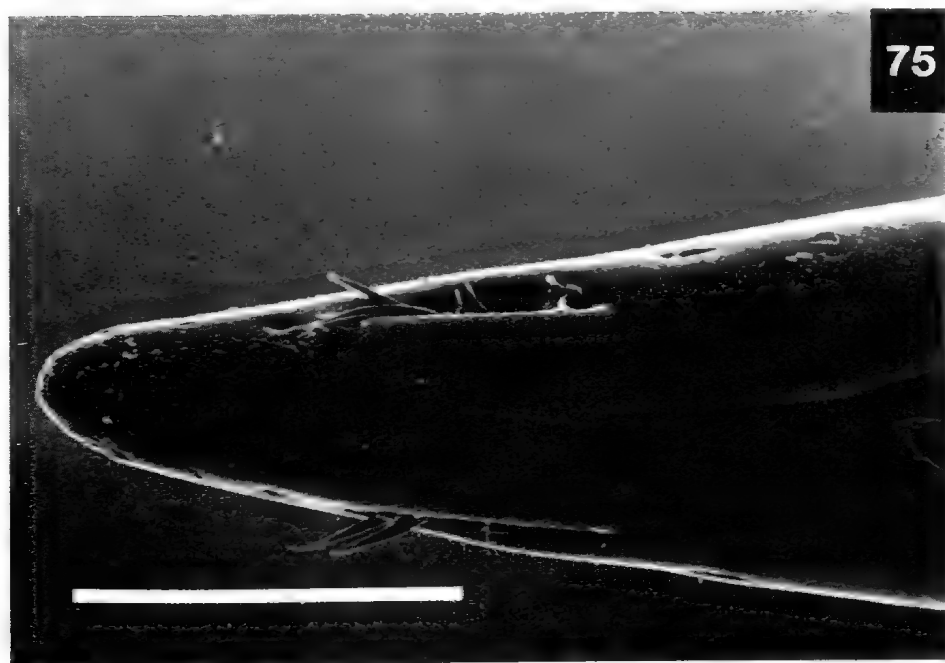
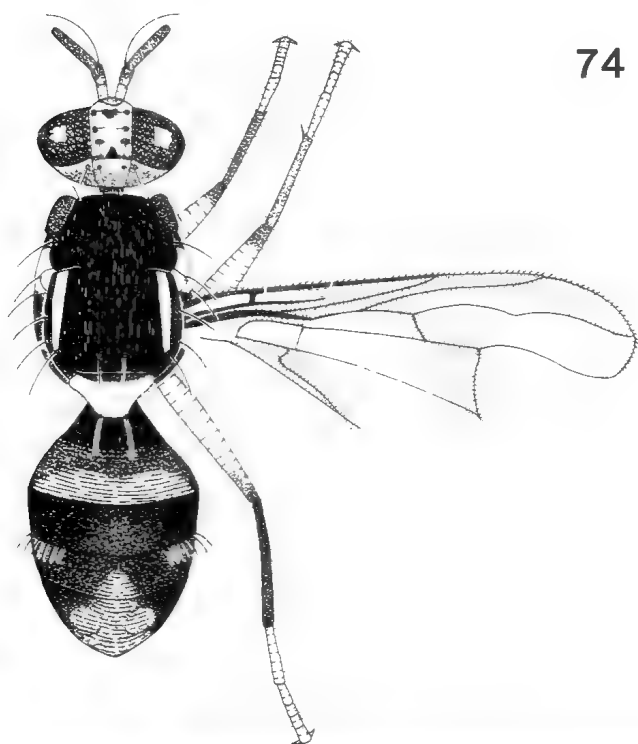


72

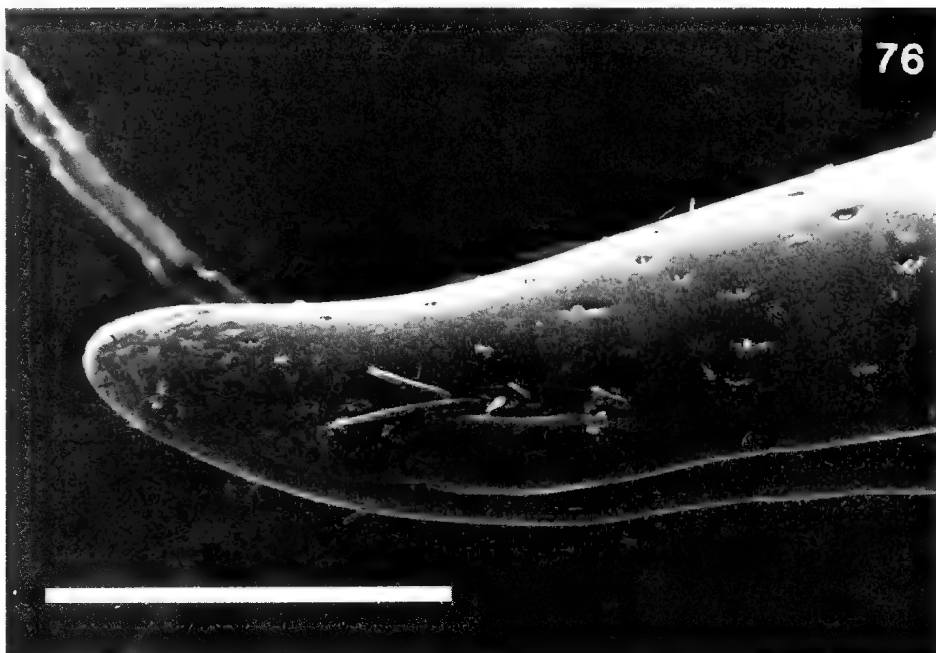


73

FIG. 72. *Bactrocera* (*Bactrocera*) *anomala* (Drew), adult male (x12). FIG. 73. *Bactrocera* (*Bactrocera*) *atriliniellata* n. sp., adult male (x9).

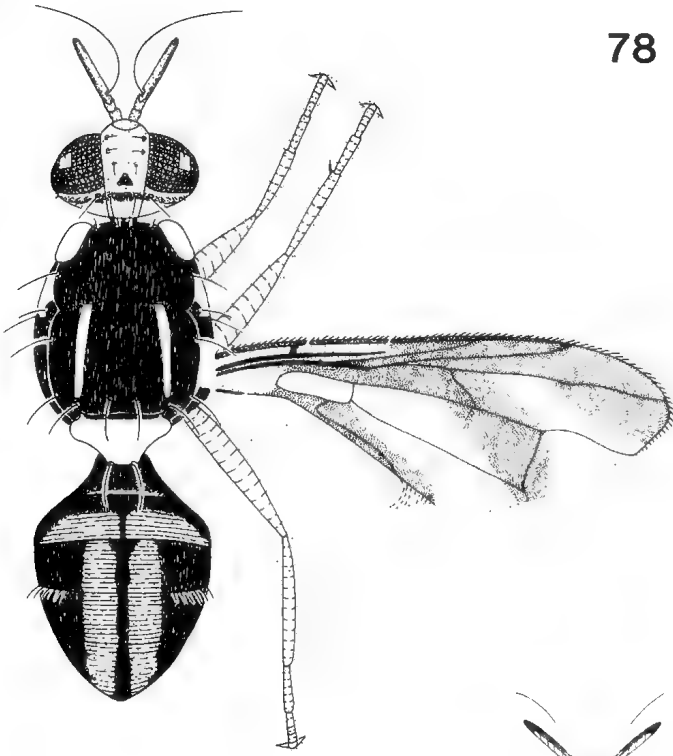


FIGS 74–75. *Bactrocera* (*Bactrocera*) *curreyi* n. sp.: 74, adult male (x9); 75, apex of aculeus dorsal view (scale 0.1 mm).



FIGS 76–77. *Bactrocera* (*Bactrocera*) *curreyi* n. sp.: 76, apex of aculeus lateral view (scale 0.1 mm); 77, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

78



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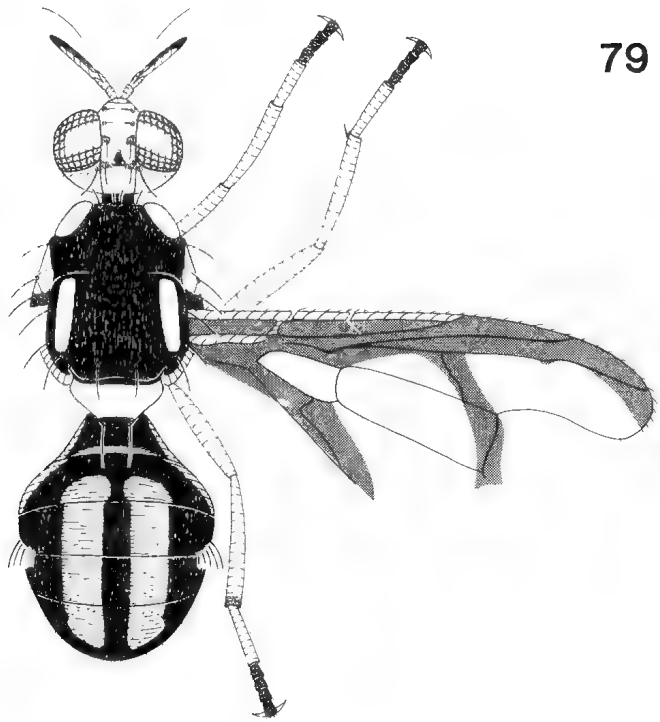
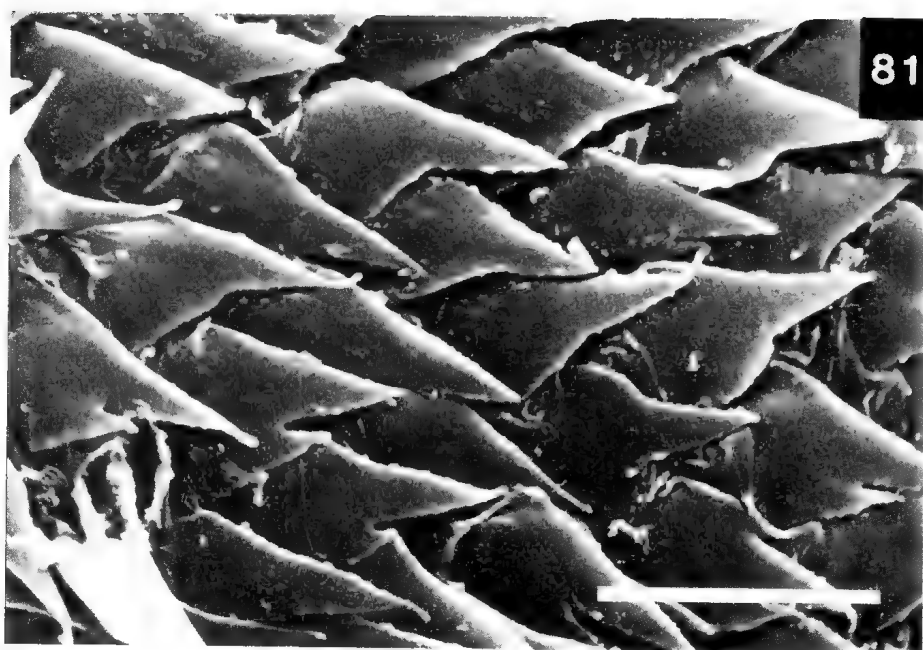
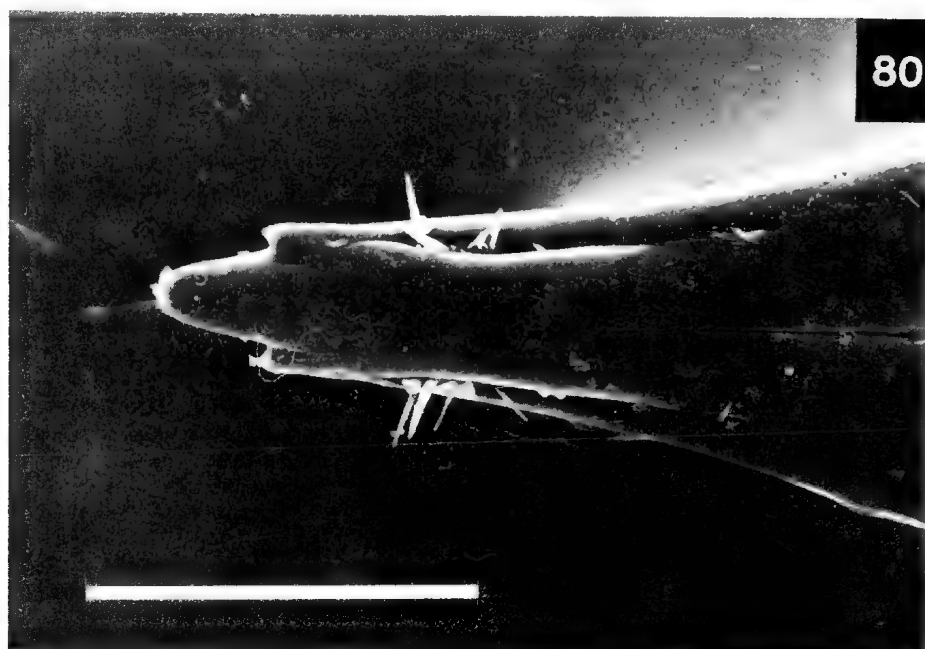
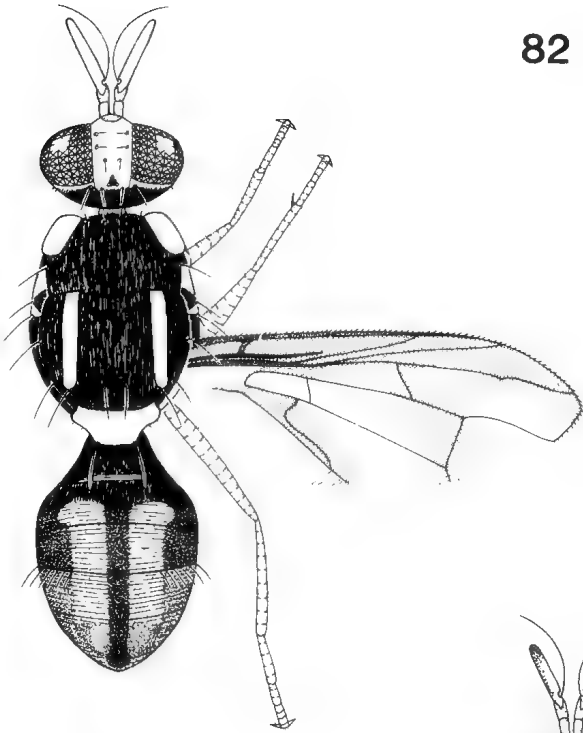


FIG. 78. *Bactrocera* (*Bactrocera*) *decumana* (Drew), adult male (x7). FIG. 79. *Bactrocera* (*Bactrocera*) *distincta* (Malloch), adult male (x10).



FIGS 80–81. *Bactrocera (Bactrocera) distincta* (Malloch): 80, apex of aculeus (scale 0.1 mm); 81, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

82



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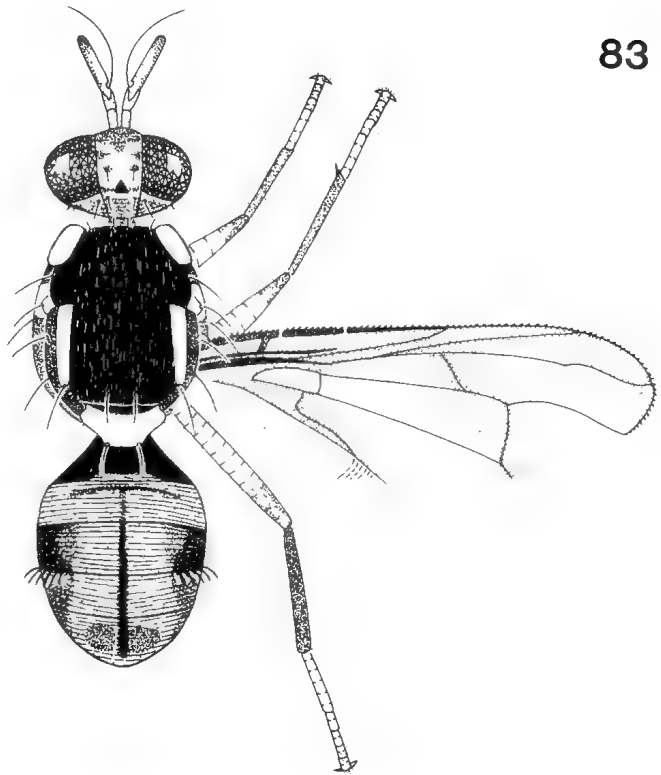
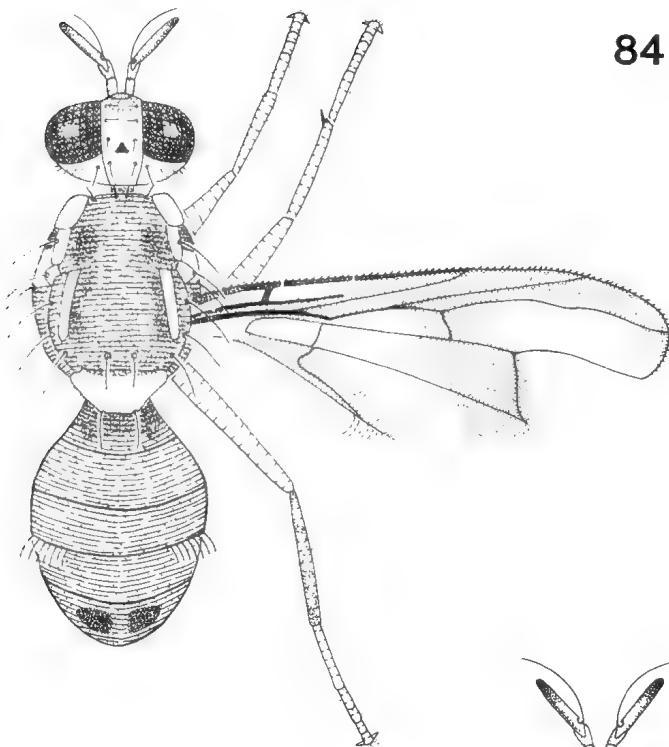
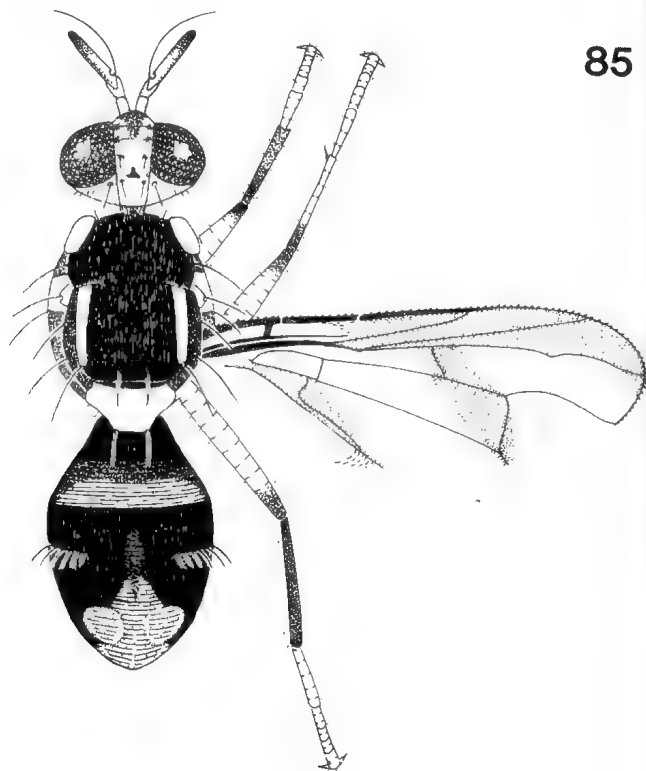


FIG. 82. *Bactrocera (Bactrocera) fergussoniensis* n. sp., adult male (x7). FIG. 83. *Bactrocera (Bactrocera) furvilineata* n. sp., adult male (x9).



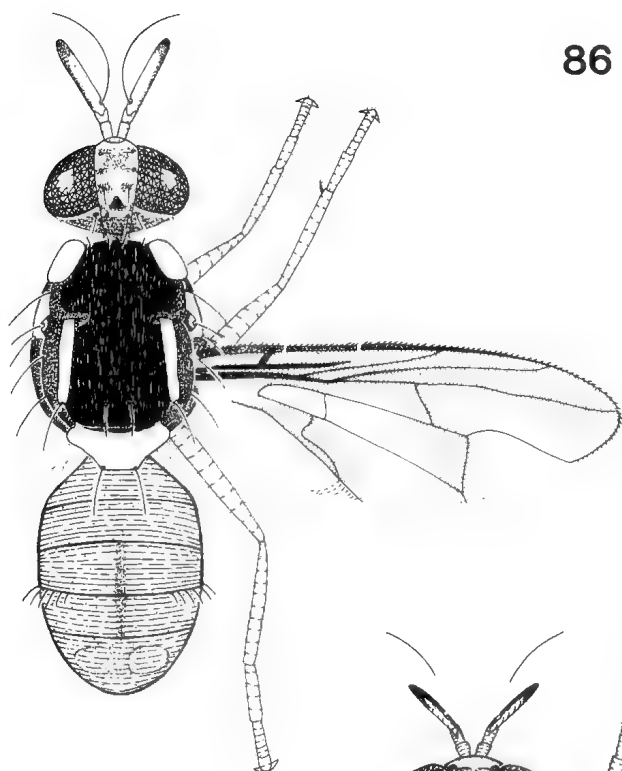
84



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FIG. 84. *Bactrocera* (*Bactrocera*) *morobiensis* n. sp., adult male (x9). FIG. 85. *Bactrocera* (*Bactrocera*) *oblineata* n. sp., adult male (x9).

86



87

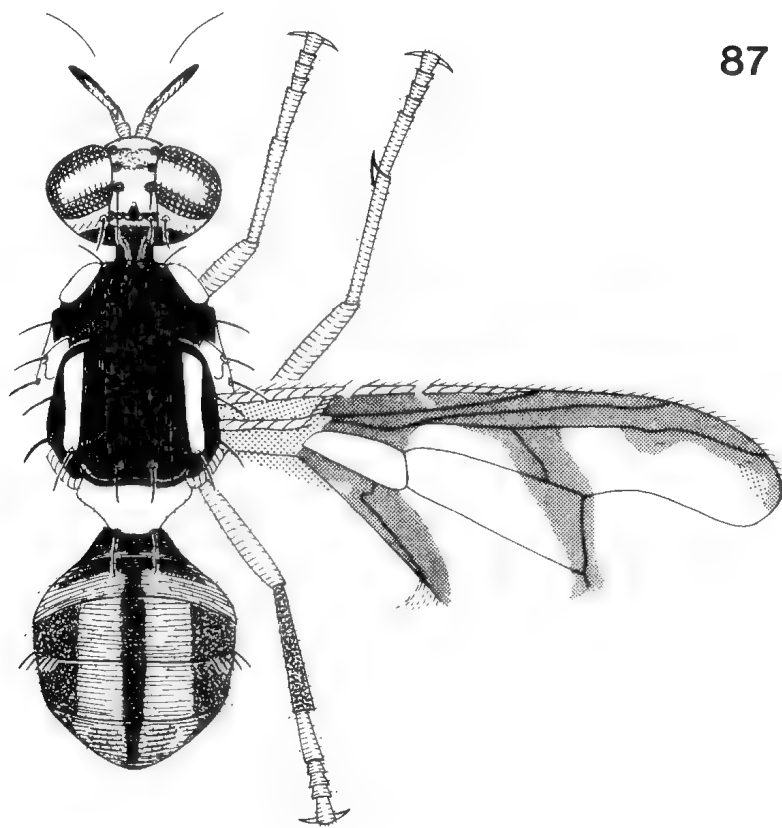
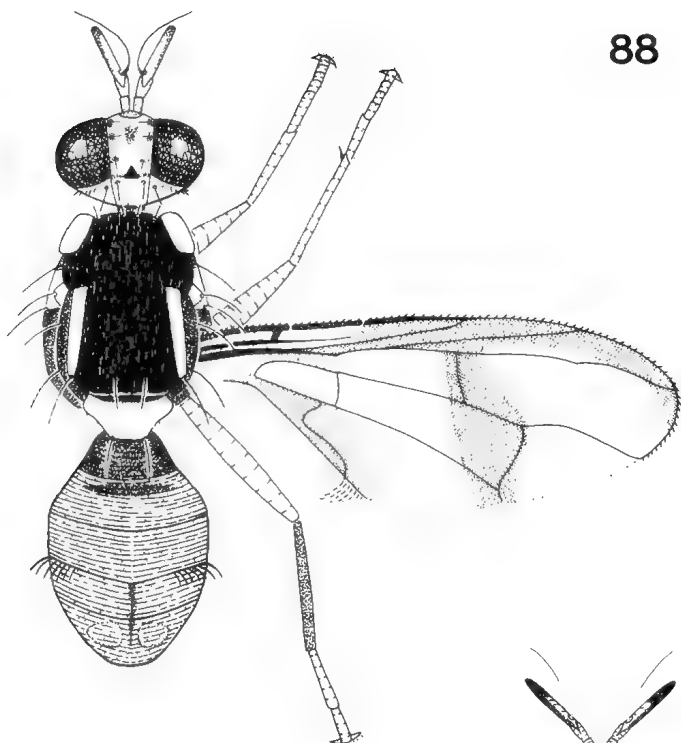
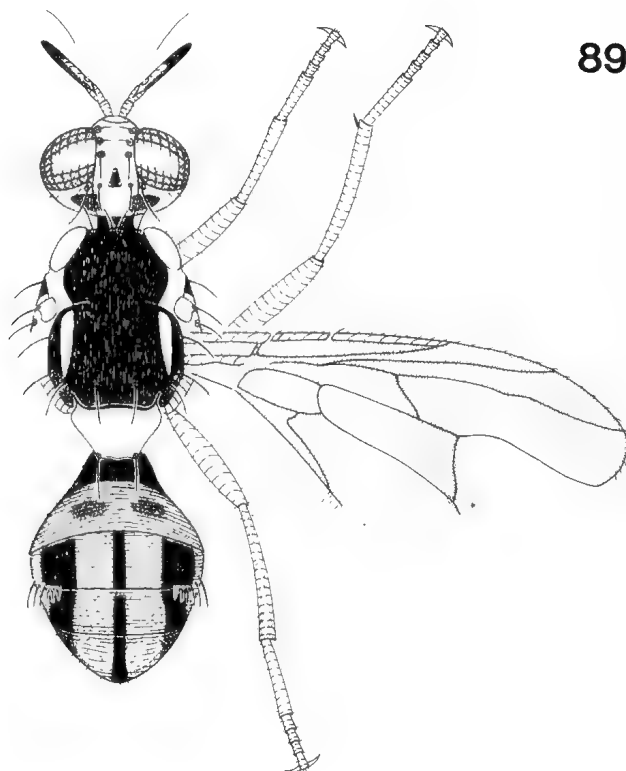


FIG. 86. *Bactrocera (Bactrocera) propedistincta* n. sp., adult male (x8). FIG. 87. *Bactrocera (Bactrocera) pseudodistincta* (Drew), adult male (x12).

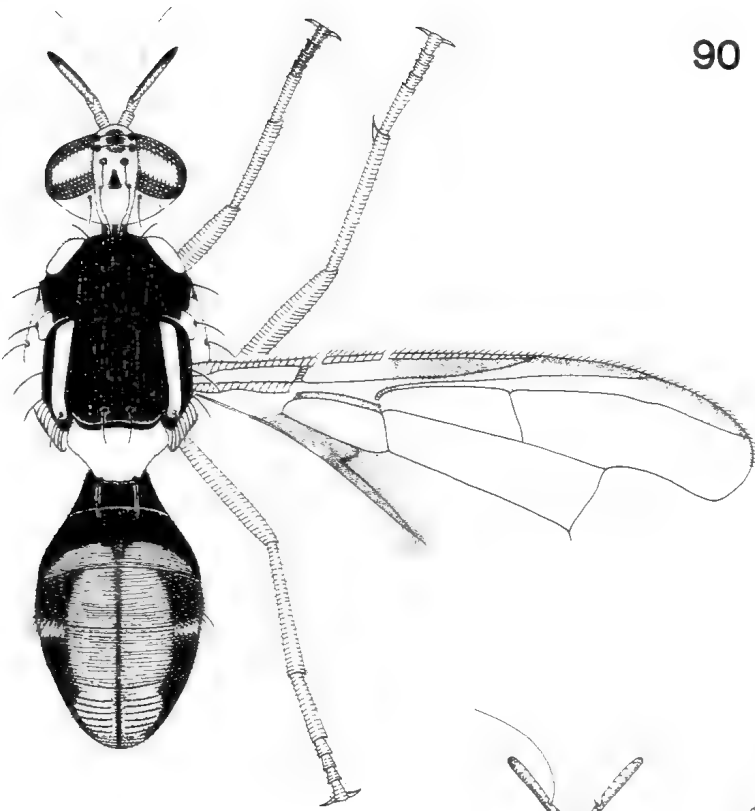


88

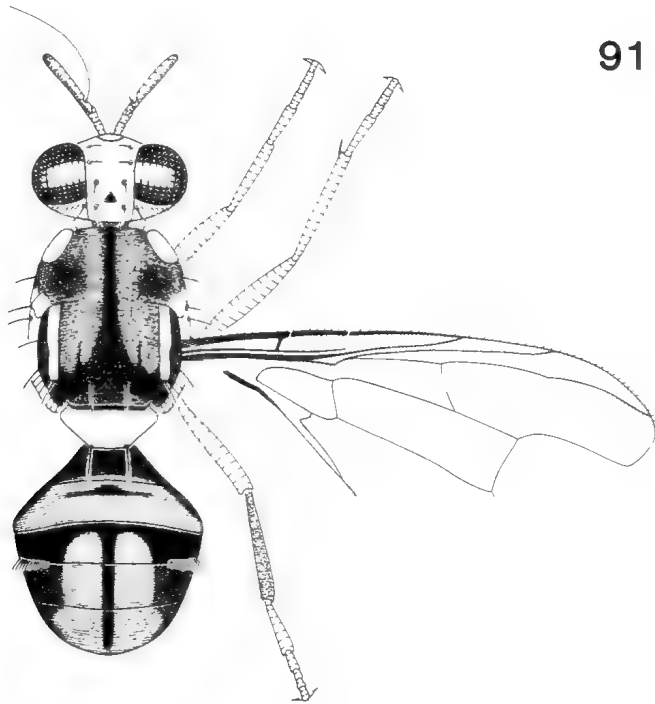


89

FIG. 88. *Bactrocera* (*Bactrocera*) *rhabdota* n. sp., adult male (x10). FIG. 89. *Bactrocera* (*Bactrocera*) *unifasciata* (Malloch), adult male (x12).

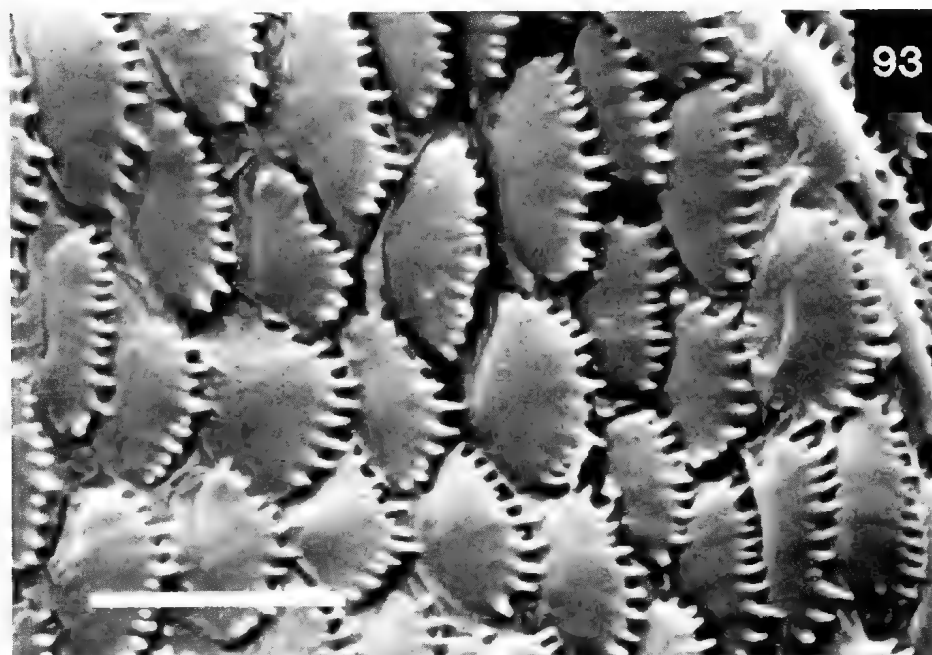
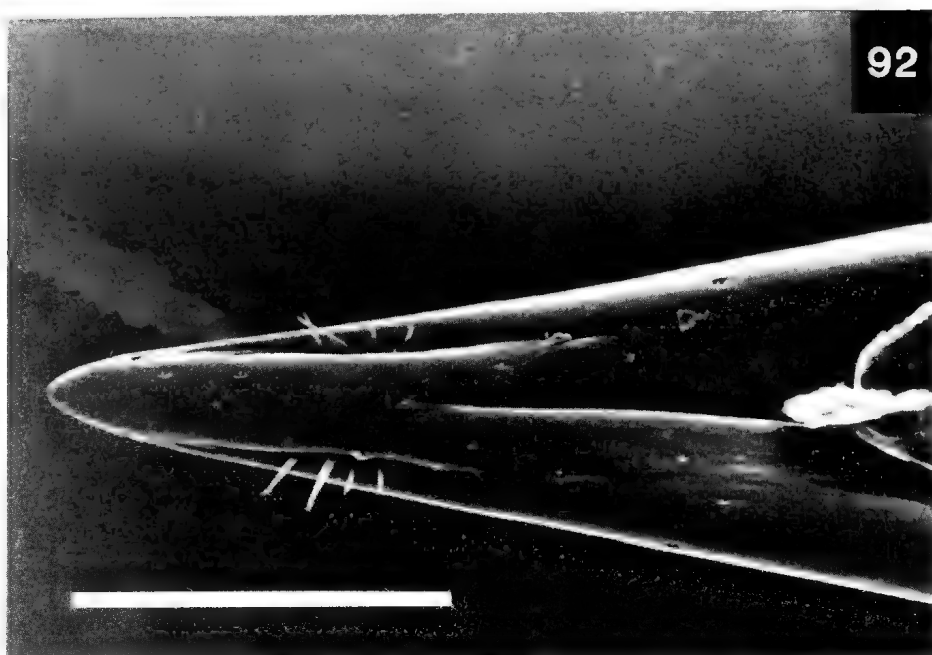


90

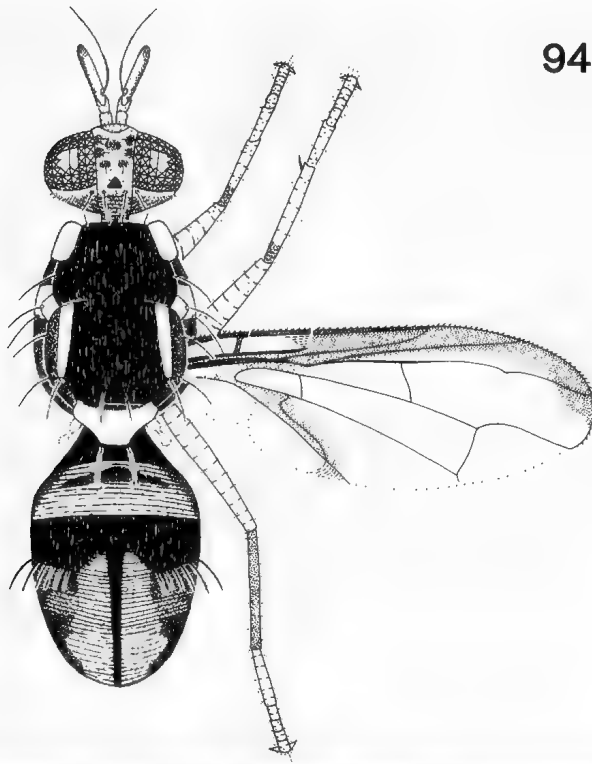


91

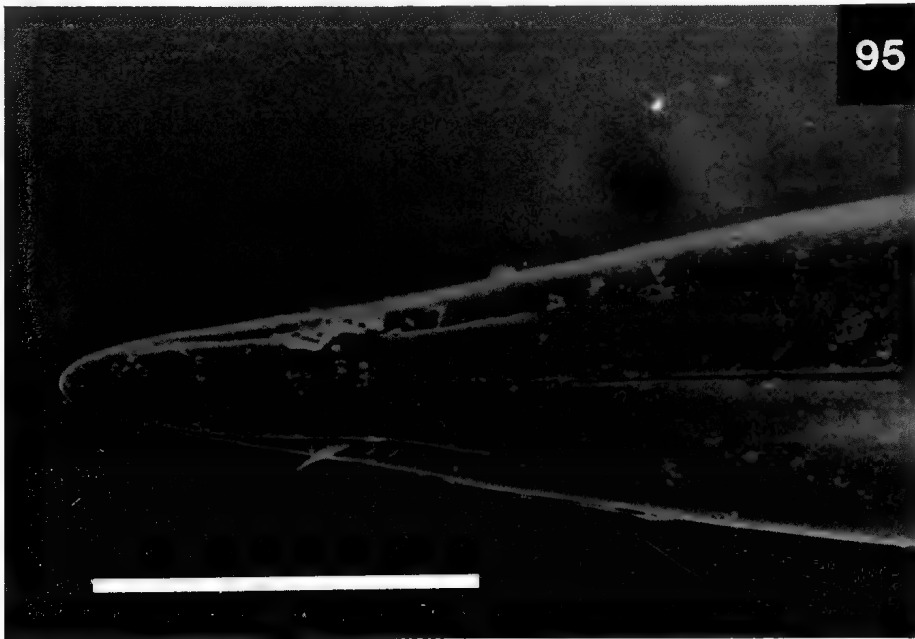
FIG. 90. *Bactrocera* (*Bactrocera*) *abdolonginqua* (Drew), adult male (x10). FIG. 91. *Bactrocera* (*Bactrocera*) *cacuminata* (Hering), adult male (x9).



FIGS 92–93. *Bactrocera* (*Bactrocera*) *cacuminata* (Hering): 92, apex of aculeus (scale 0.1 mm); 93, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



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FIGS 94–95. *Bactrocera* (*Bactrocera*) *dapsiles* n. sp.: 94, adult male (x8); 95, apex of aculeus (scale 0.1 mm).

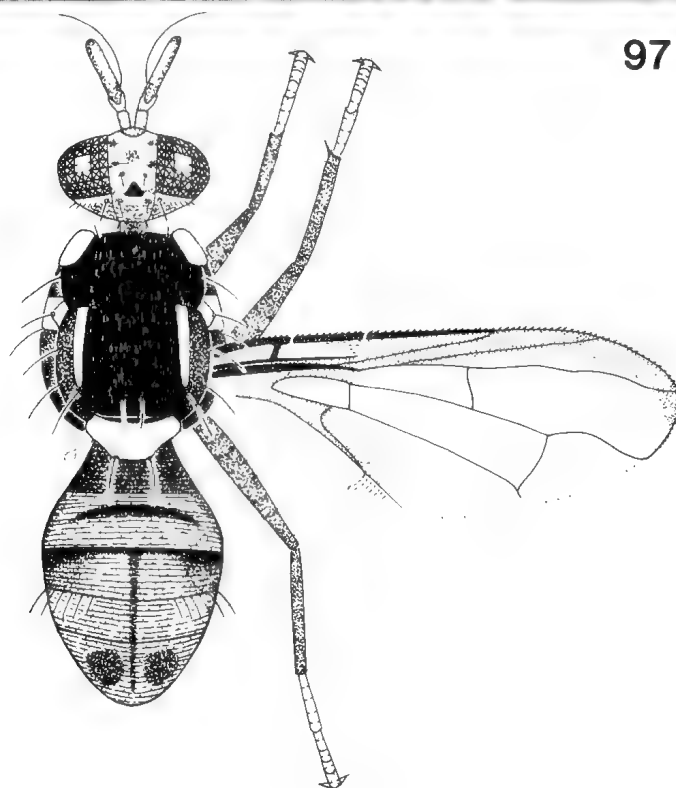
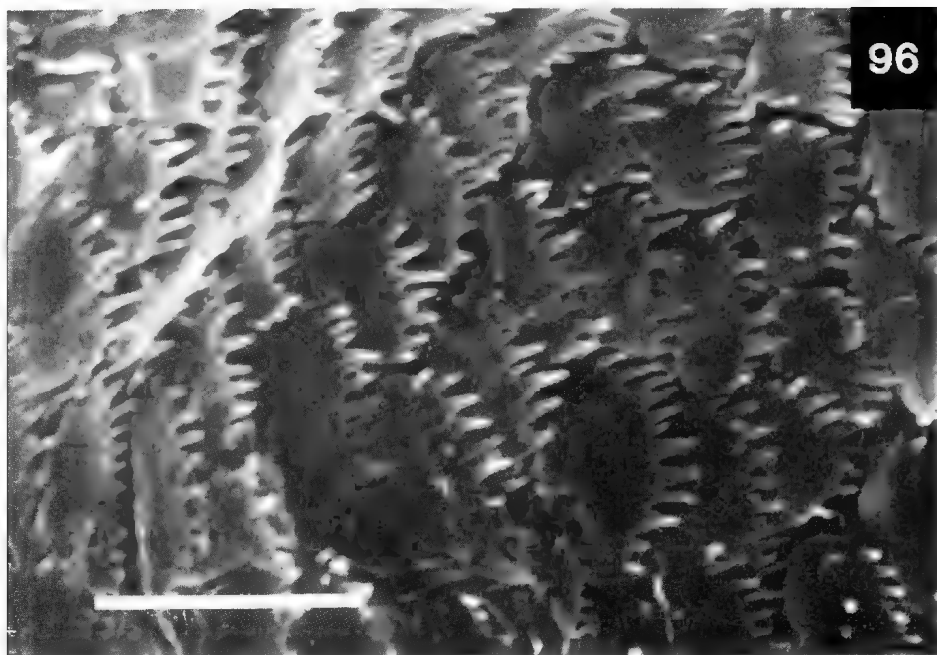
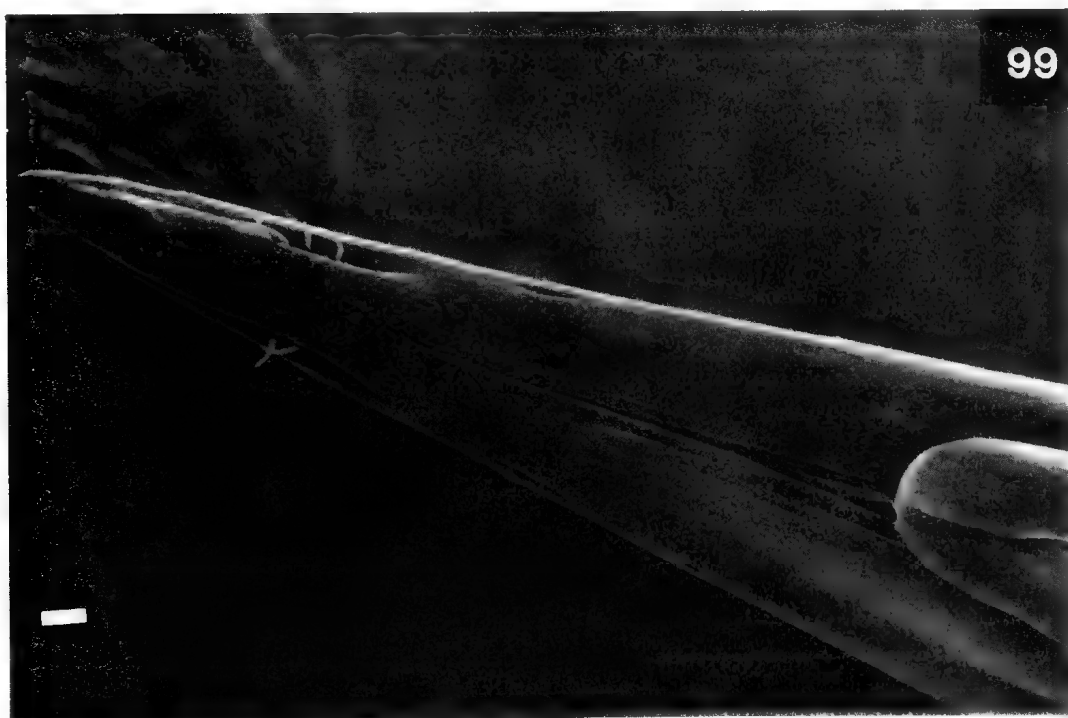
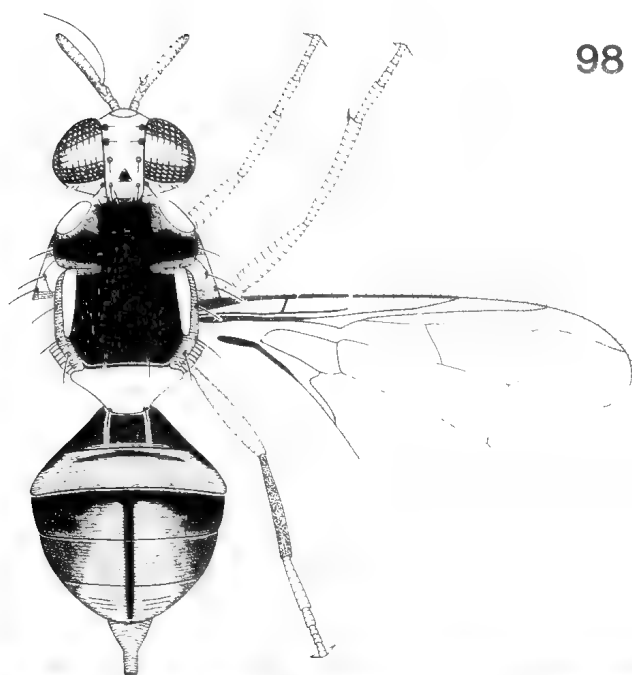
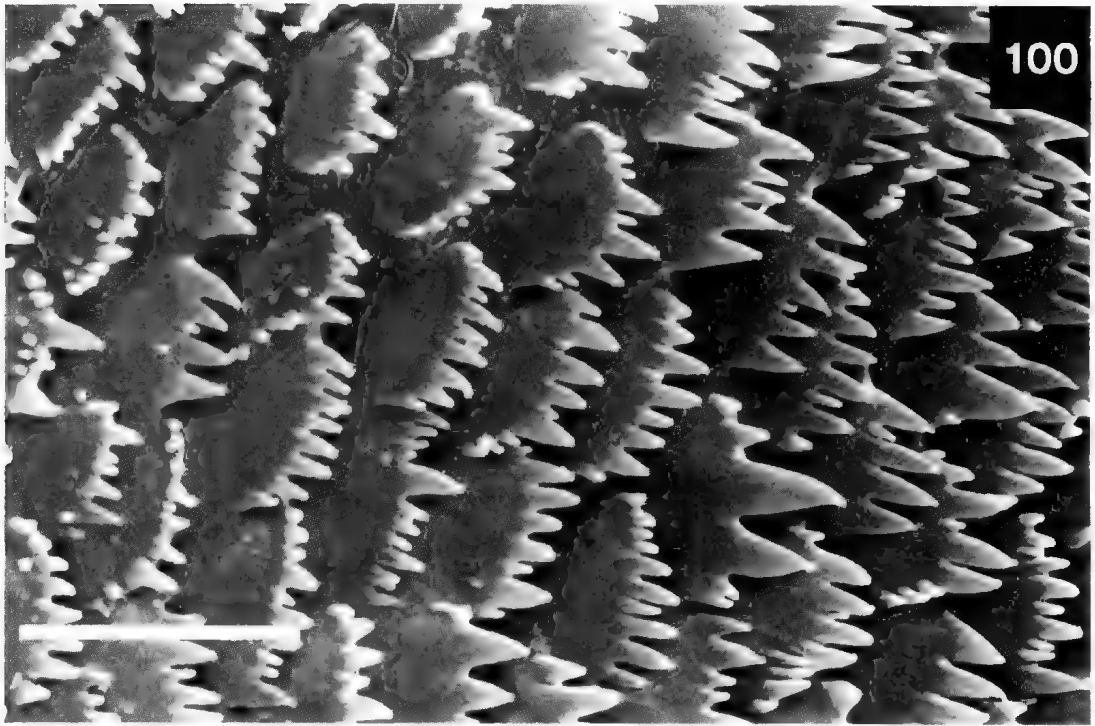


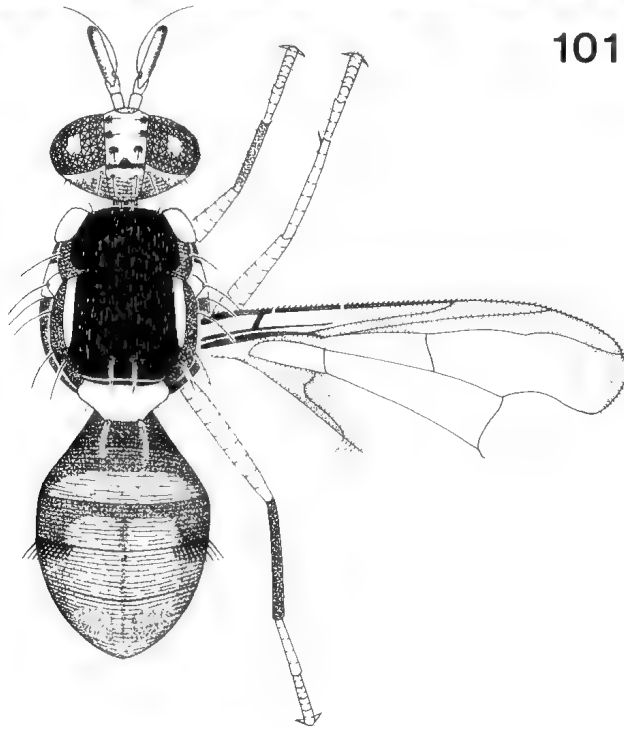
FIG. 96. *Bactrocera* (*Bactrocera*) *dapsiles* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 97. *Bactrocera* (*Bactrocera*) *diallagma* n. sp., adult male (x9).



FIGS 98–99. *Bactrocera* (*Bactrocera*) *endiandrae* (Perkins and May): 98, adult female (x10); 99, apex of aculeus (scale 0.01 mm).

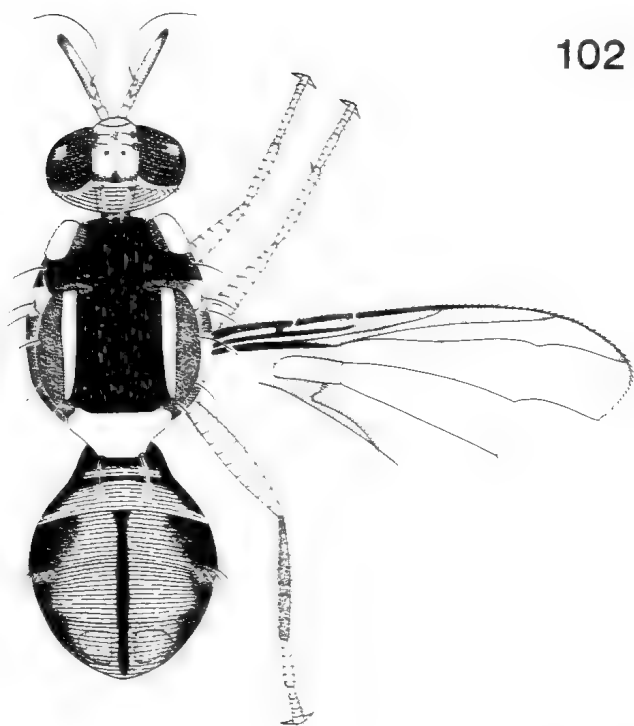


100

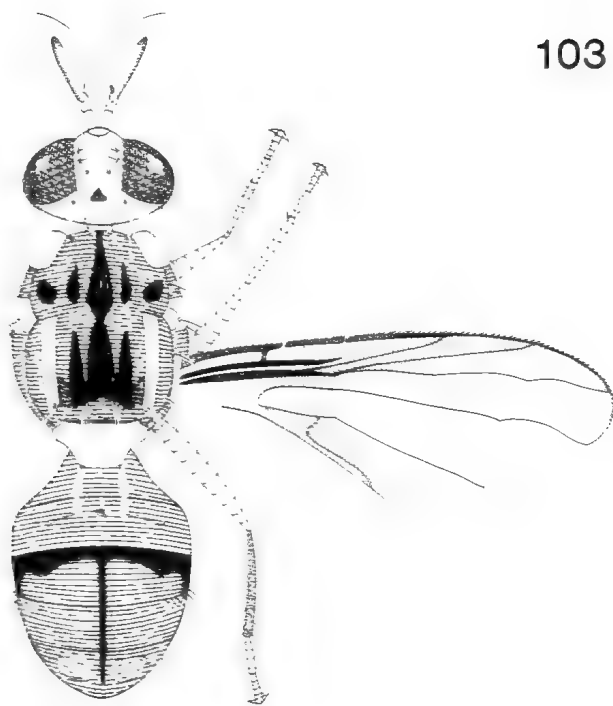


101

FIG. 100. *Bactrocera* (*Bactrocera*) *endiandrae* (Perkins and May), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 101. *Bactrocera* (*Bactrocera*) *mimulus* n. sp., adult male (x11).

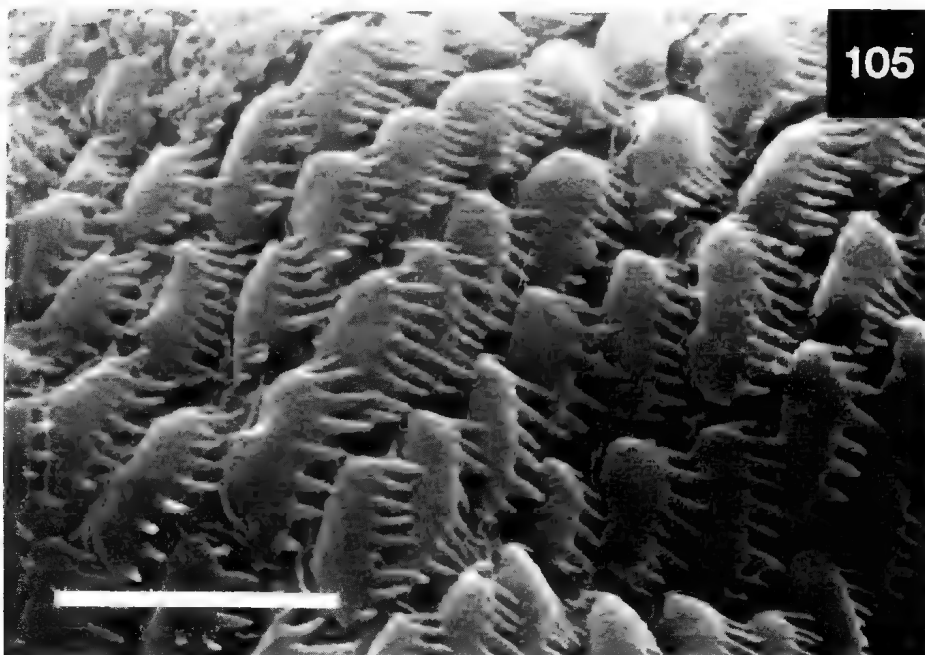
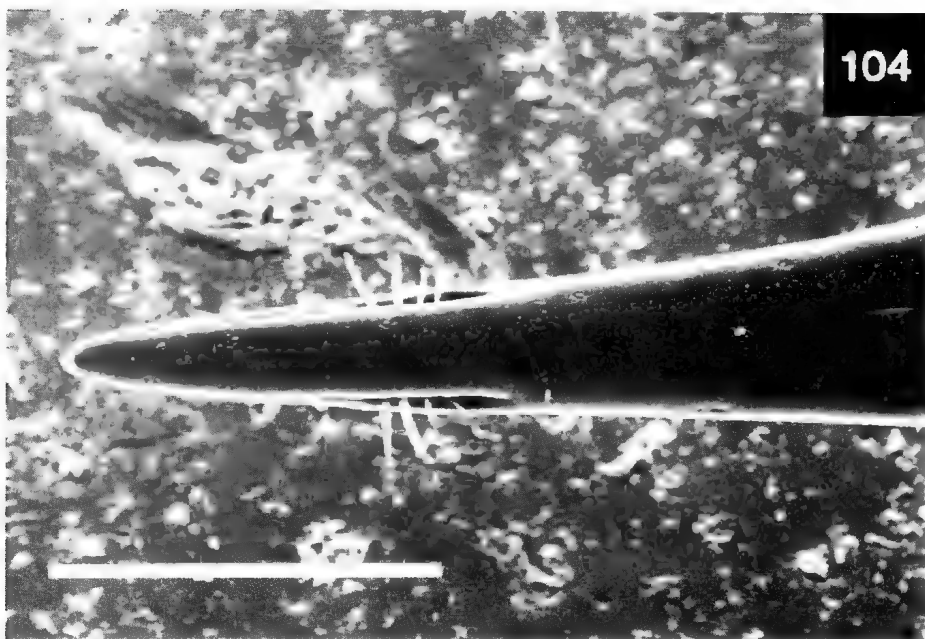


102

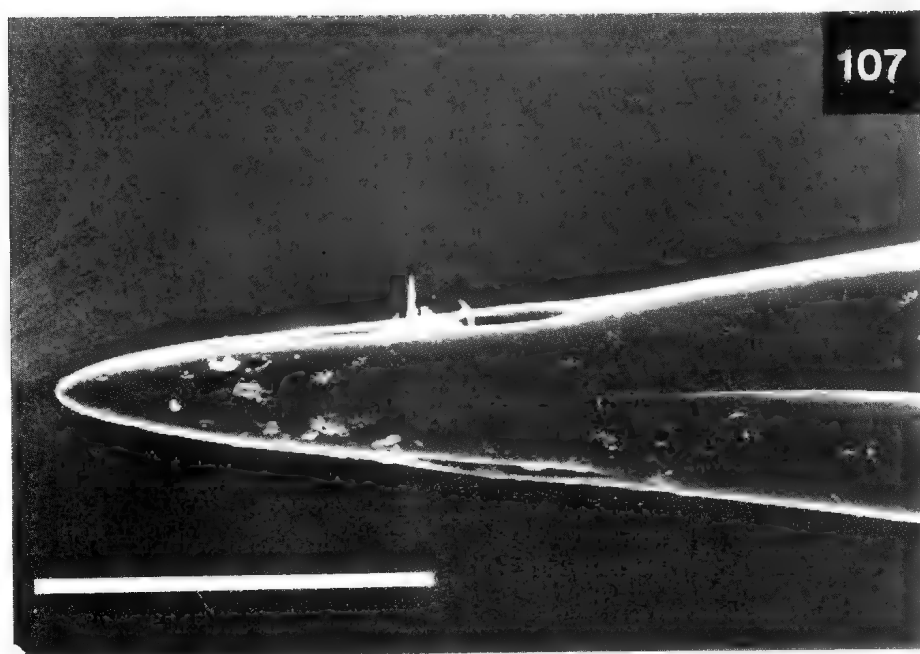
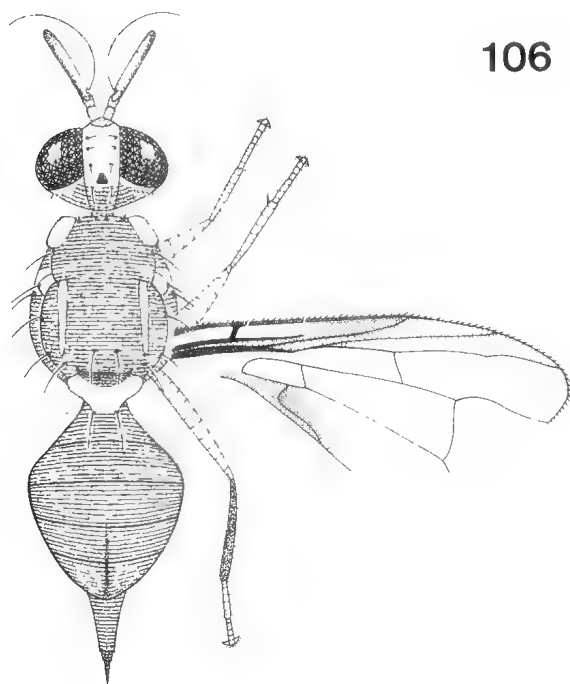


103

FIG. 102. *Bactrocera* (*Bactrocera*) *nigrescens* (Drew), adult male (x9). FIG. 103. *Bactrocera* (*Bactrocera*) *opiliae* (Drew and Hardy), adult male (x10).



FIGS 104–105. *Bactrocera* (*Bactrocera*) *opiliae* (Drew and Hardy): 104, apex of aculeus (scale 0.1 mm); 105, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 106–107. *Bactrocera* (*Bactrocera*) *fagraea* (Tryon): 106, adult female (x8); 107, apex of aculeus (scale 0.1 mm).

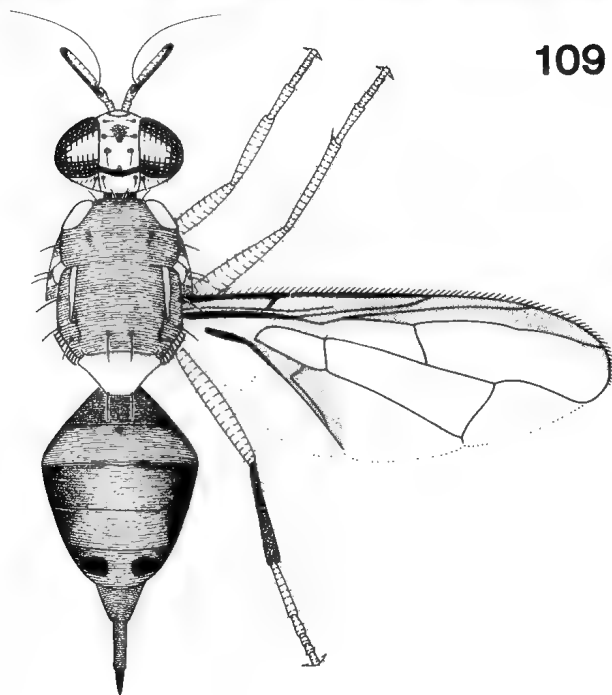
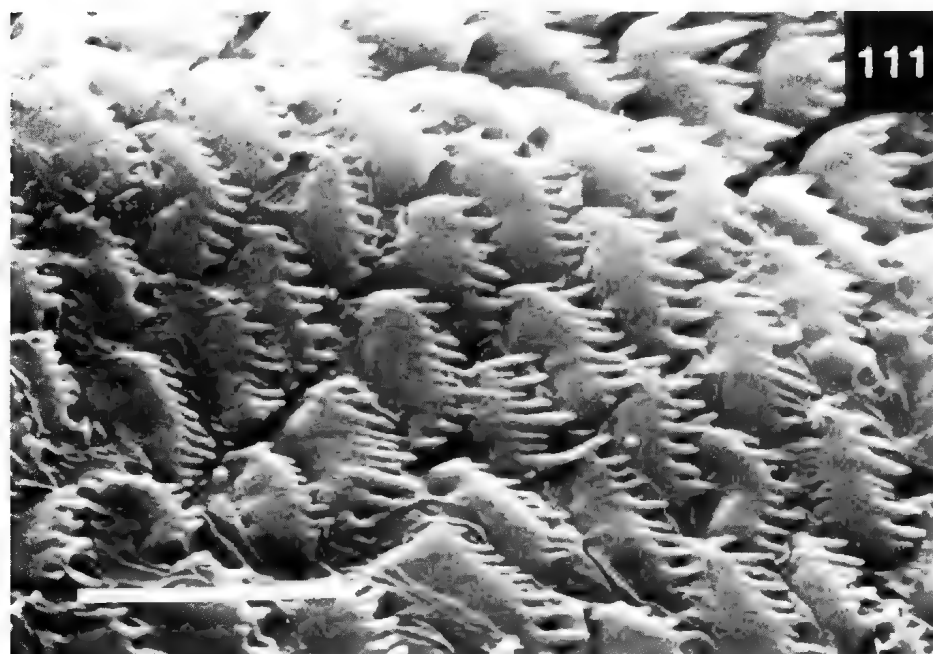
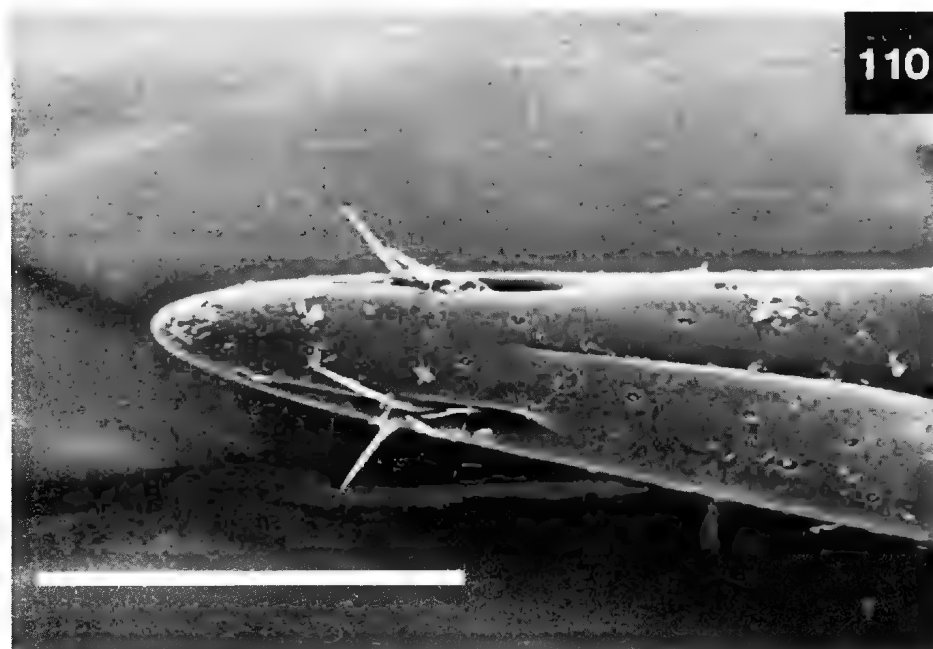
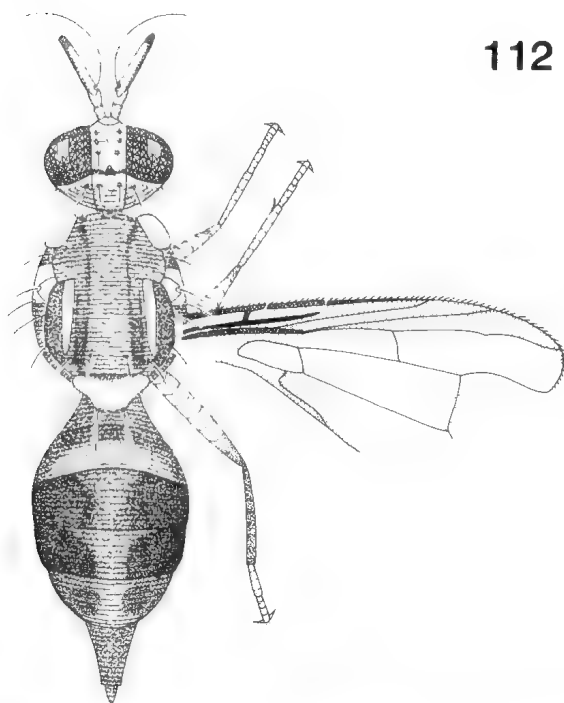


FIG. 108. *Bactrocera* (*Bactrocera*) *fagraea* (Tryon), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 109. *Bactrocera* (*Bactrocera*) *halfordiae* (Tryon), adult female (x8).



FIGS 110–111. *Bactrocera* (*Bactrocera*) *halfordiae* (Tryon): 110, apex of aculeus (scale 0.1 mm); 111, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 112--113. *Bactrocera* (*Bactrocera*) *kraussi* (Hardy): 112, adult female (x9); 113, apex of aculeus (scale 0.1 mm).

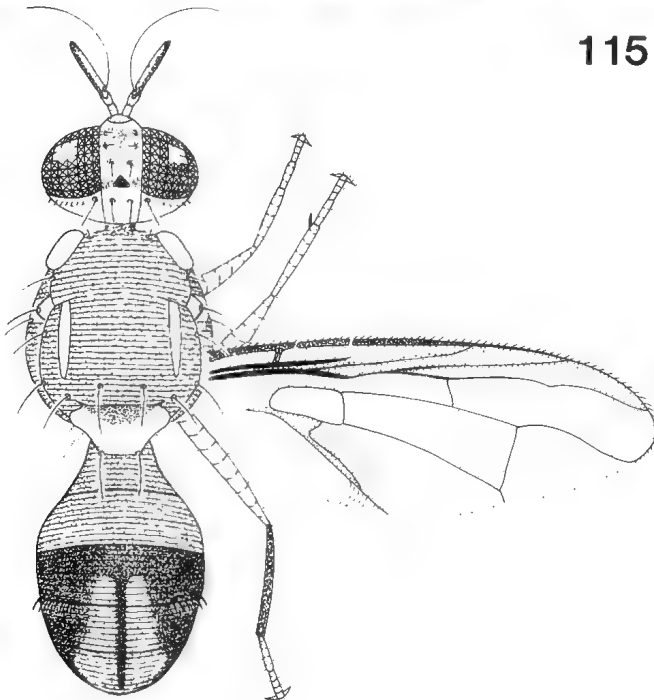
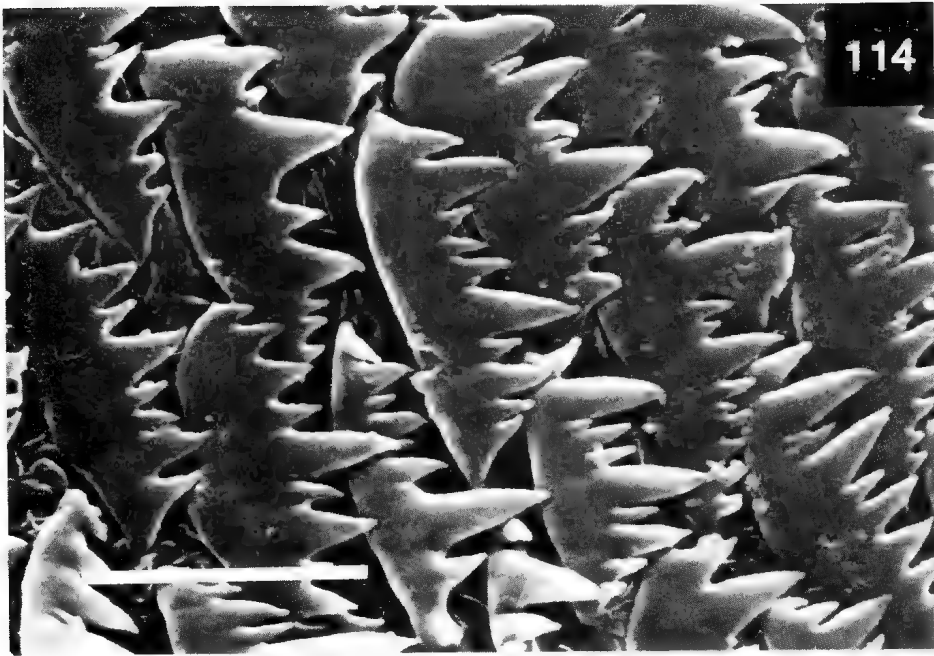
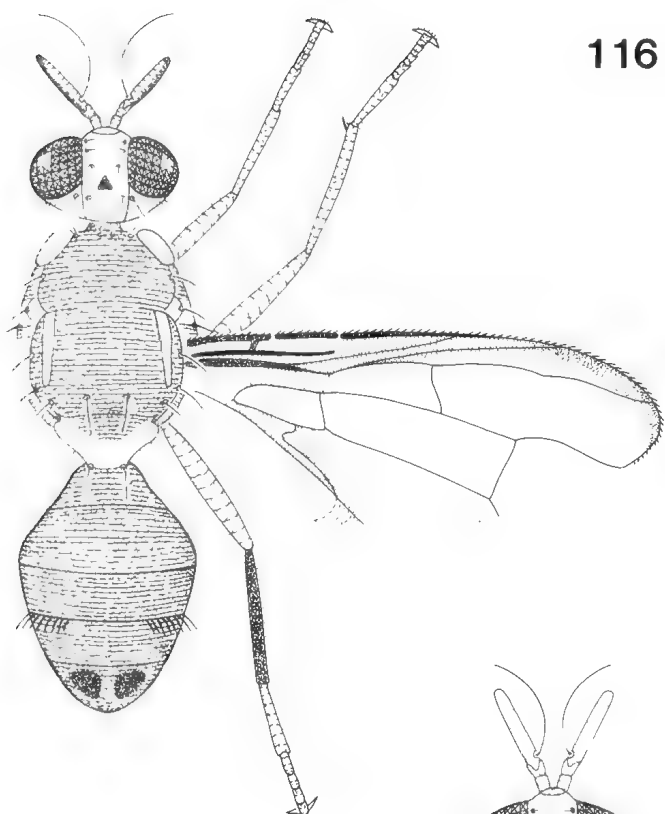
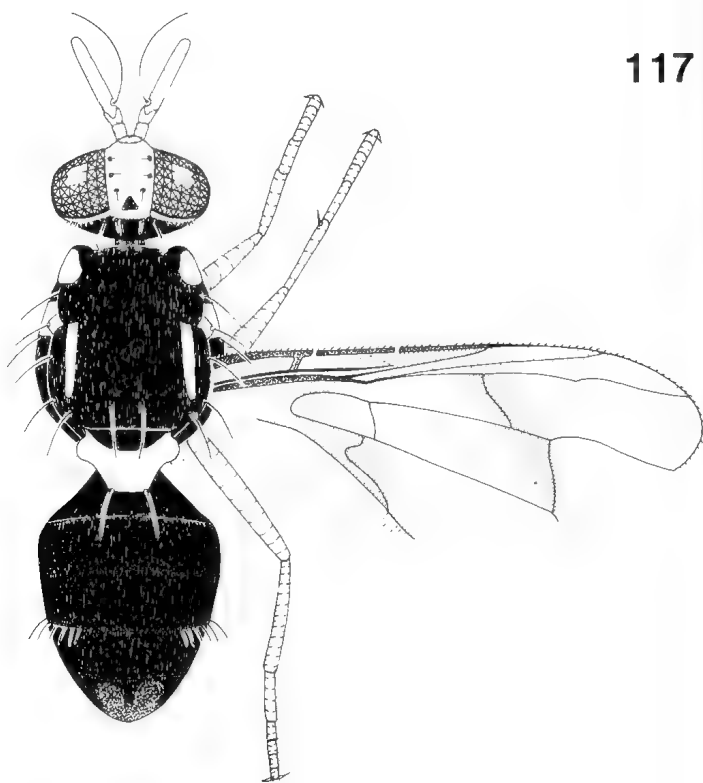


FIG. 114. *Bactrocera* (*Bactrocera*) *kraussi* (Hardy), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 115. *Bactrocera* (*Bactrocera*) *rufescens* (May), adult male (x10).

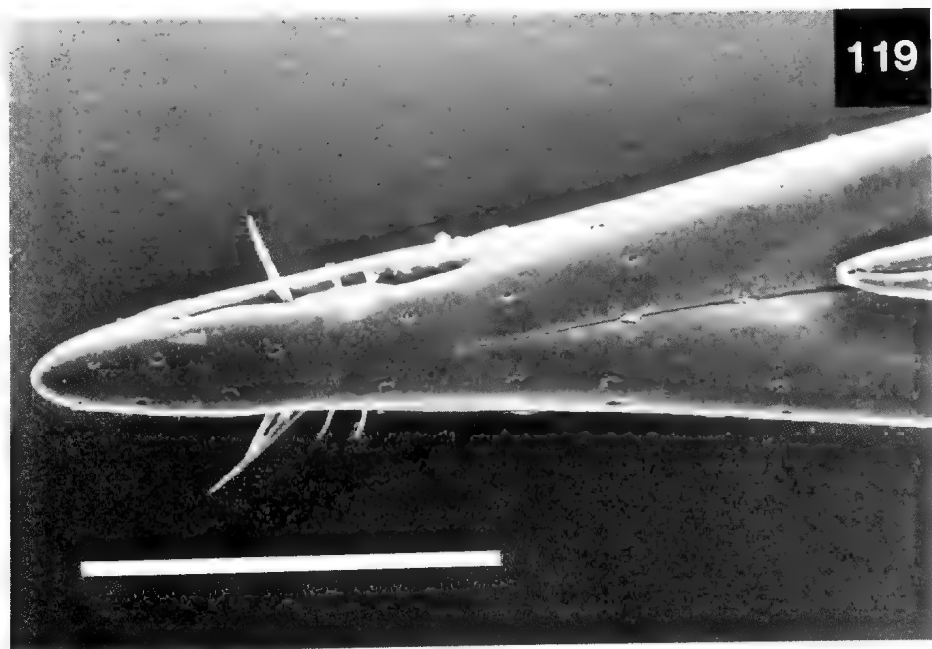
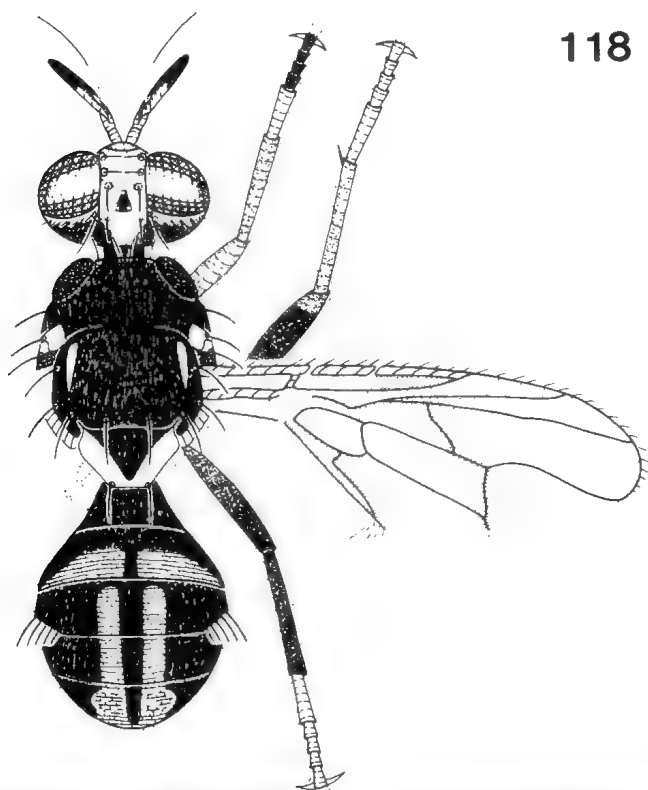


116



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FIG. 116. *Bactrocera* (*Bactrocera*) *russeola* (Drew and Hancock), adult male (x9). FIG. 117. *Bactrocera* (*Bactrocera*) *caledoniensis* n. sp., adult male (x14).



FIGS 118–119. *Bactrocera* (*Bactrocera*) *frauenfeldi* (Schiner): 118, adult male (x11); 119, apex of aculeus (scale 0.1 mm).

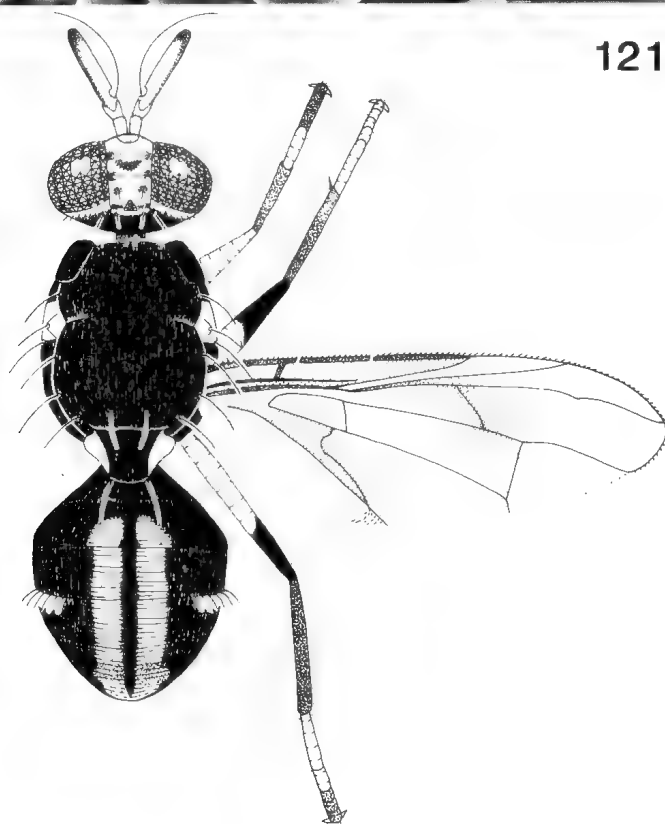
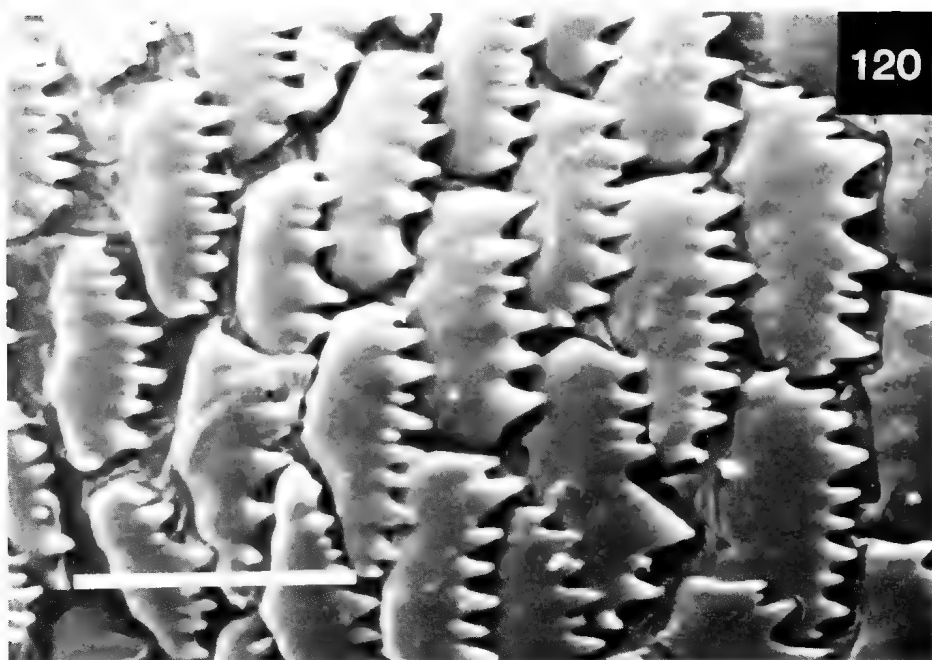
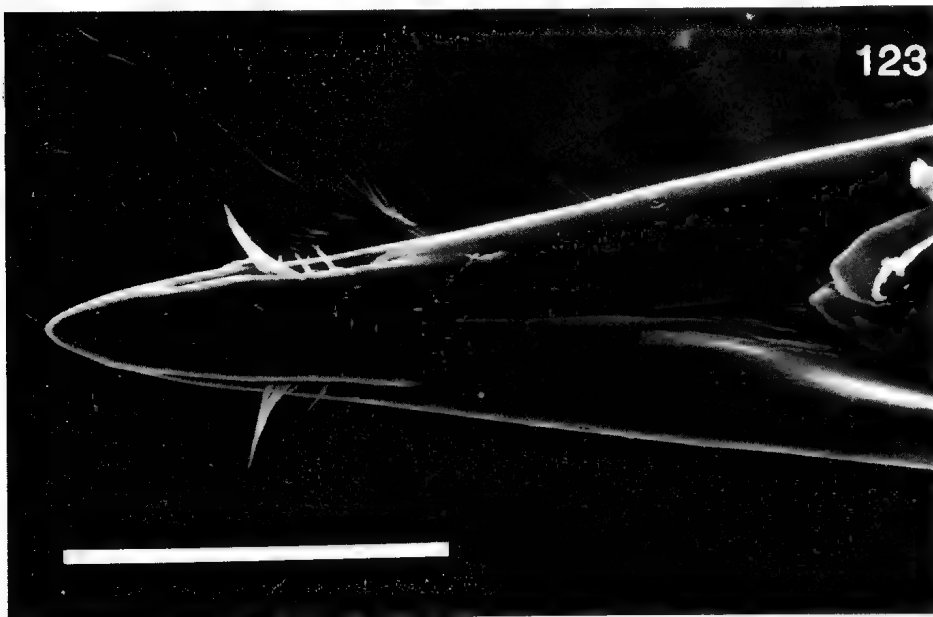
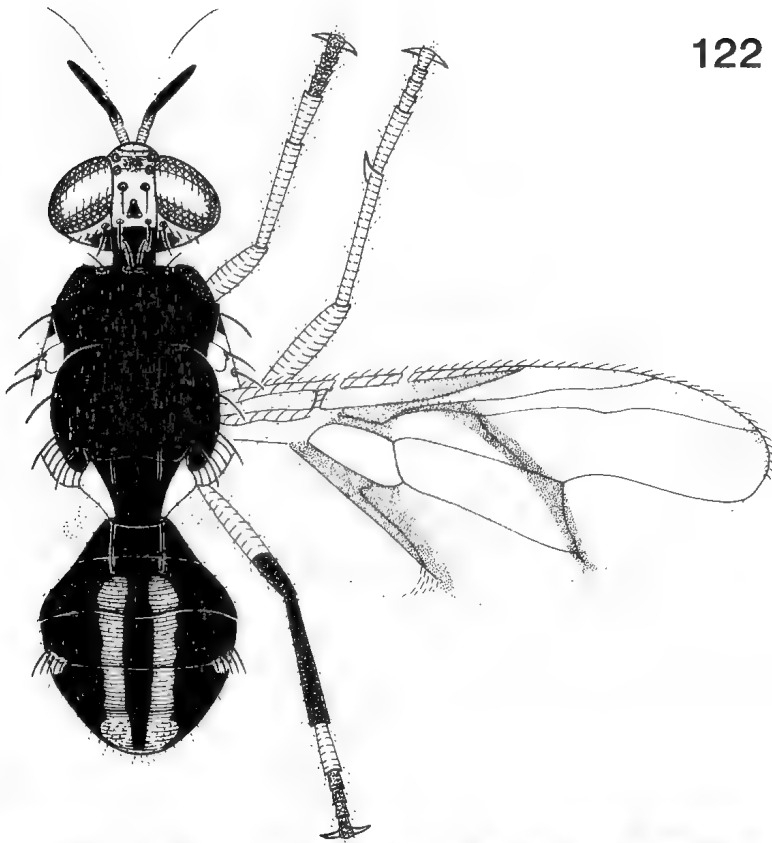
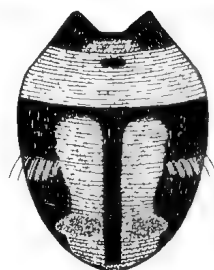
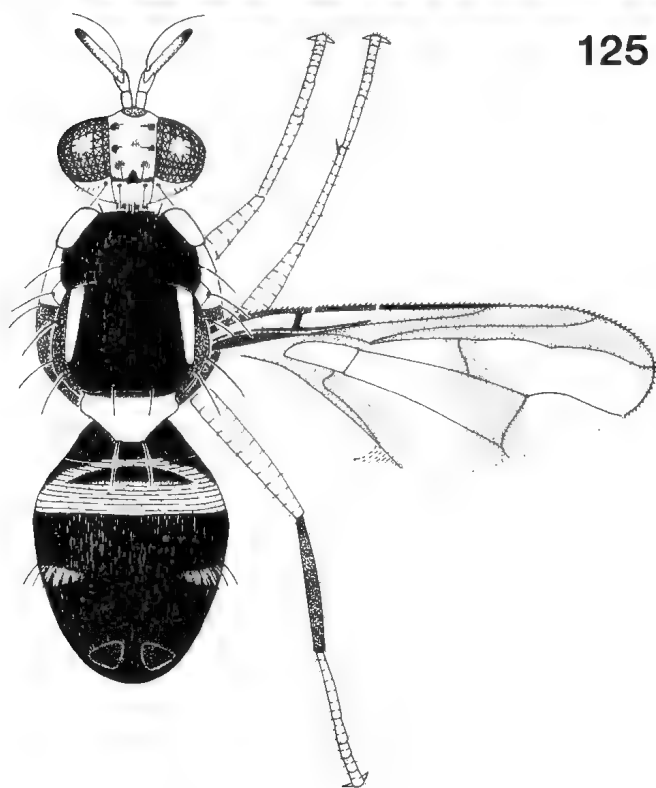
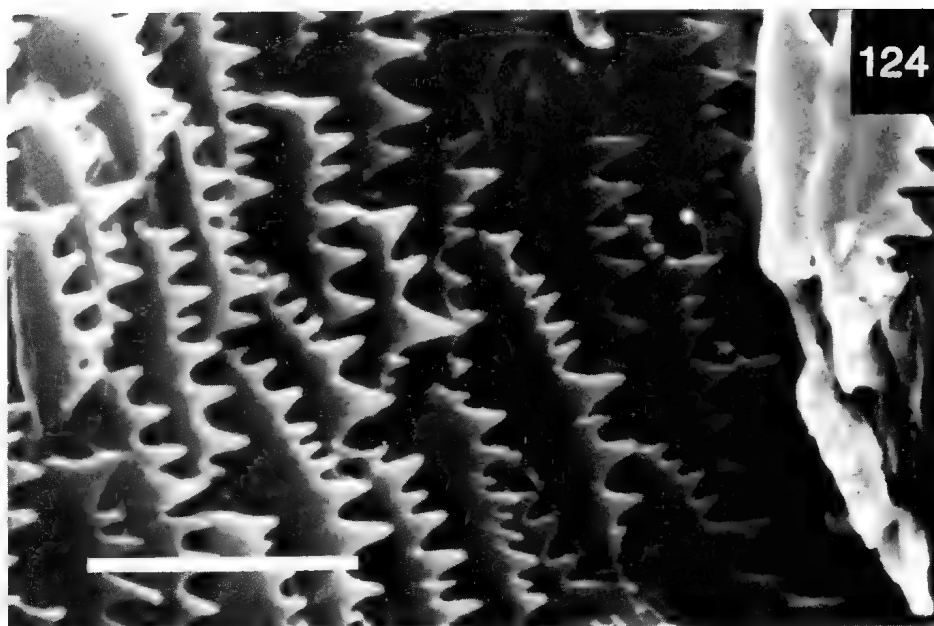


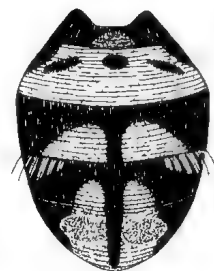
FIG. 120. *Bactrocera* (*Bactrocera*) *frauenfeldi* (Schiner), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 121. *Bactrocera* (*Bactrocera*) *parafrasienfeldi* n. sp., adult male (x11).



FIGS 122–123. *Bactrocera* (*Bactrocera*) *trilineola* n. nom.: 122, adult male (x14); 123, apex of aculeus (scale 0.1 mm).

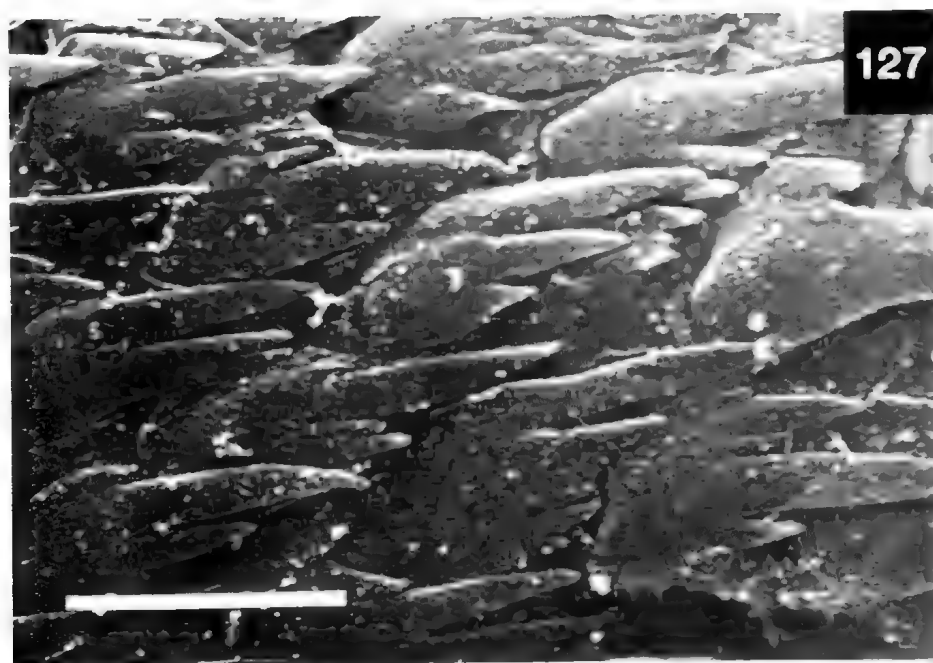
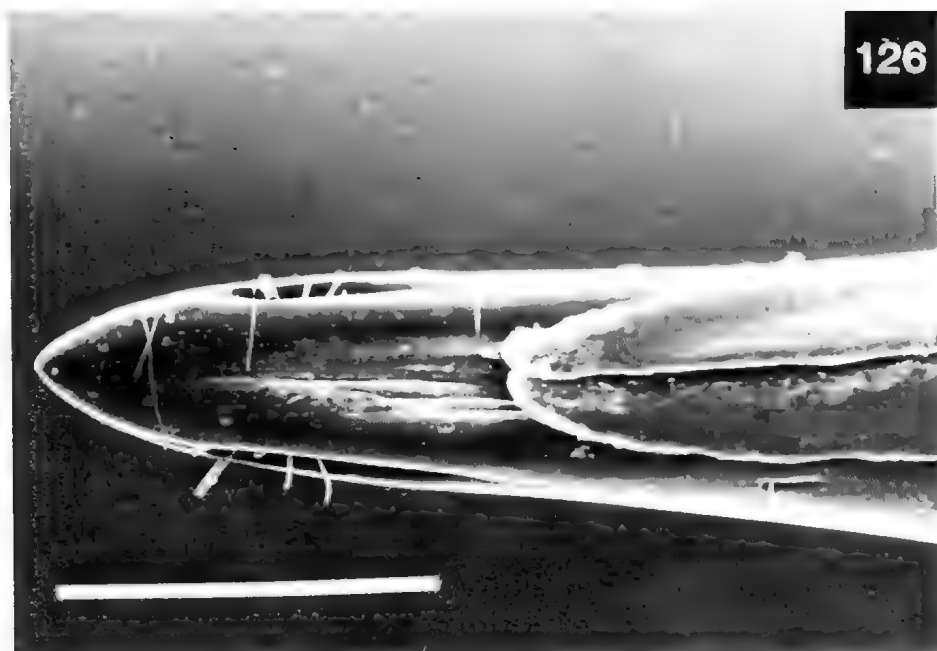


A

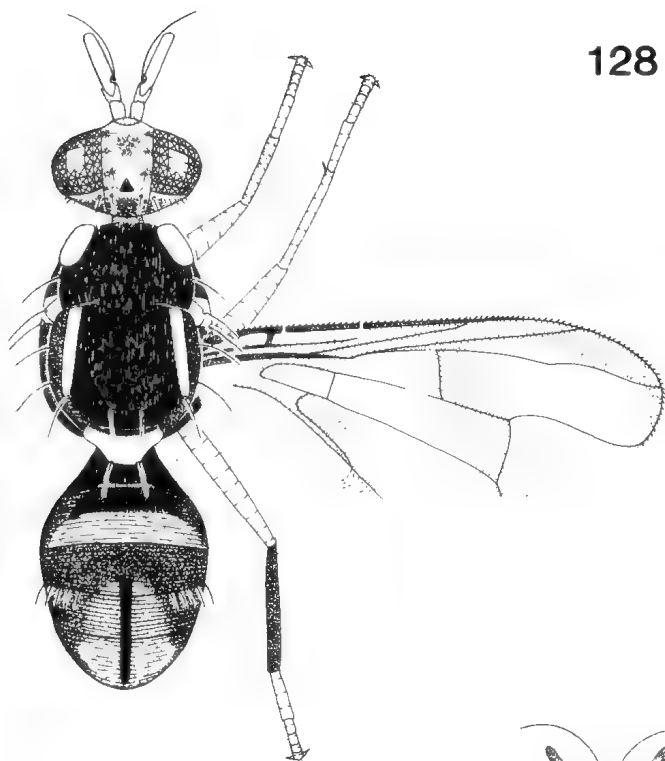


B

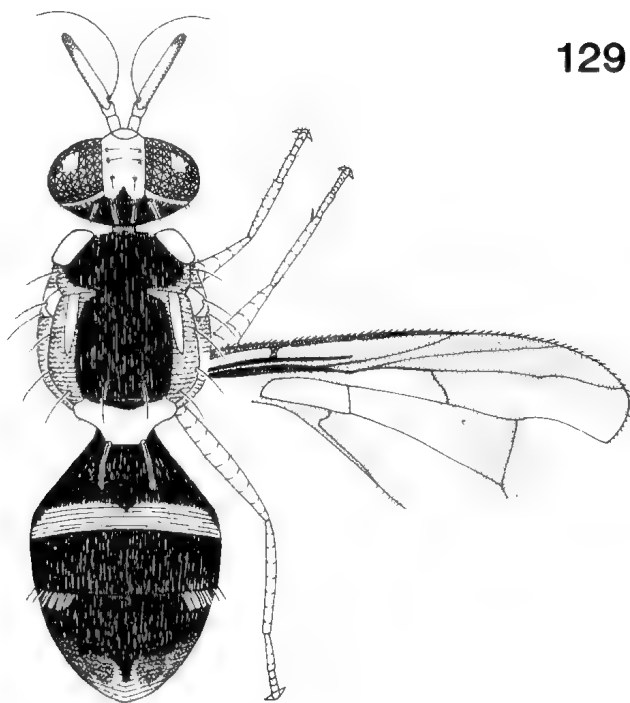
FIG. 124. *Bactrocera* (*Bactrocera*) *trilineola* n. nom., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 125. *Bactrocera* (*Bactrocera*) *fulvicauda* (Perkins), adult male (x7).



FIGS 126–127. *Bactrocera* (*Bactrocera*) *fulvicauda* (Perkins): 126, apex of aculeus (scale 0.1 mm); 127, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

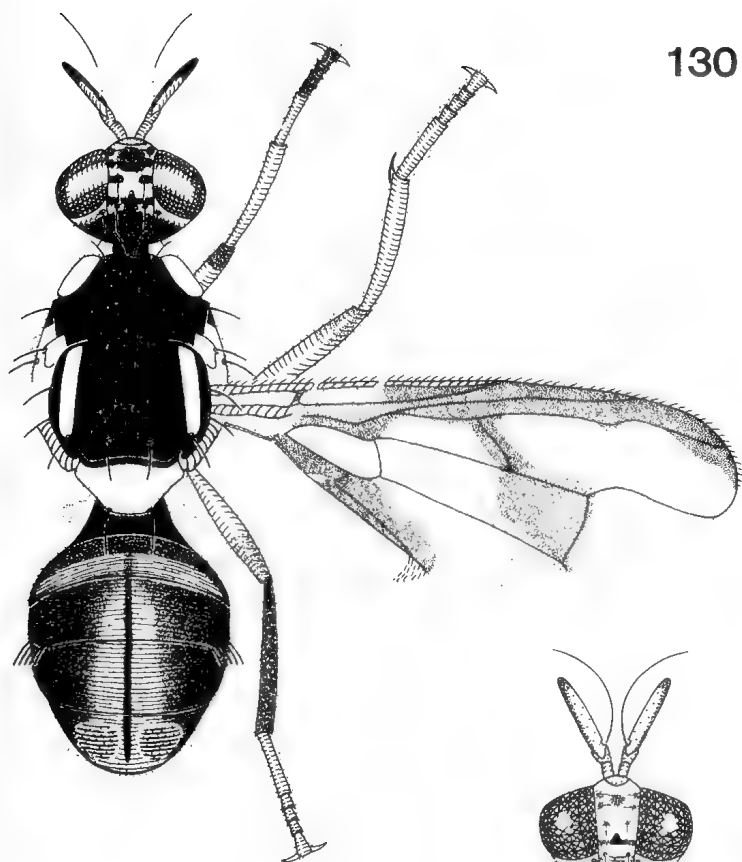


128

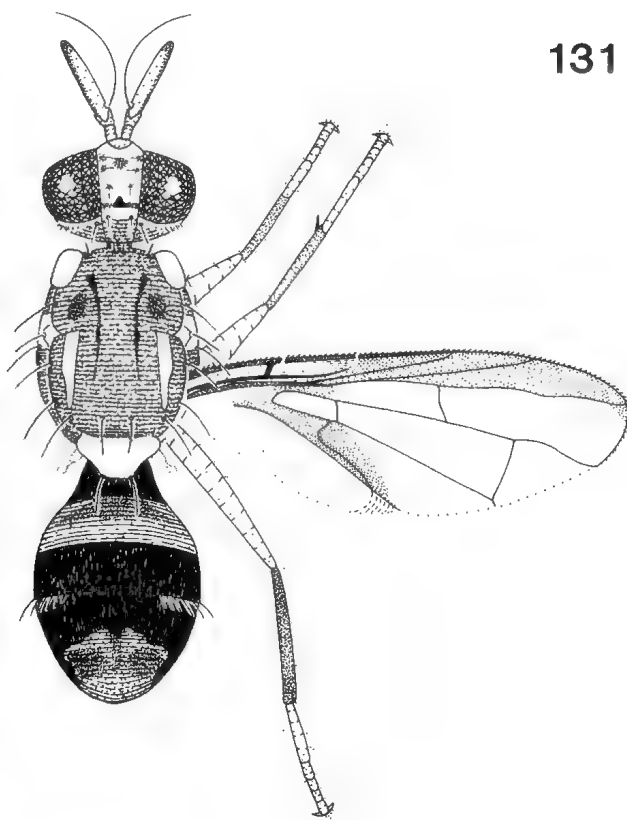


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FIG. 128. *Bactrocera* (*Bactrocera*) *latilineata* n. sp., adult male (x9). FIG. 129. *Bactrocera* (*Bactrocera*) *pulchra* Tryon, adult male (x8).

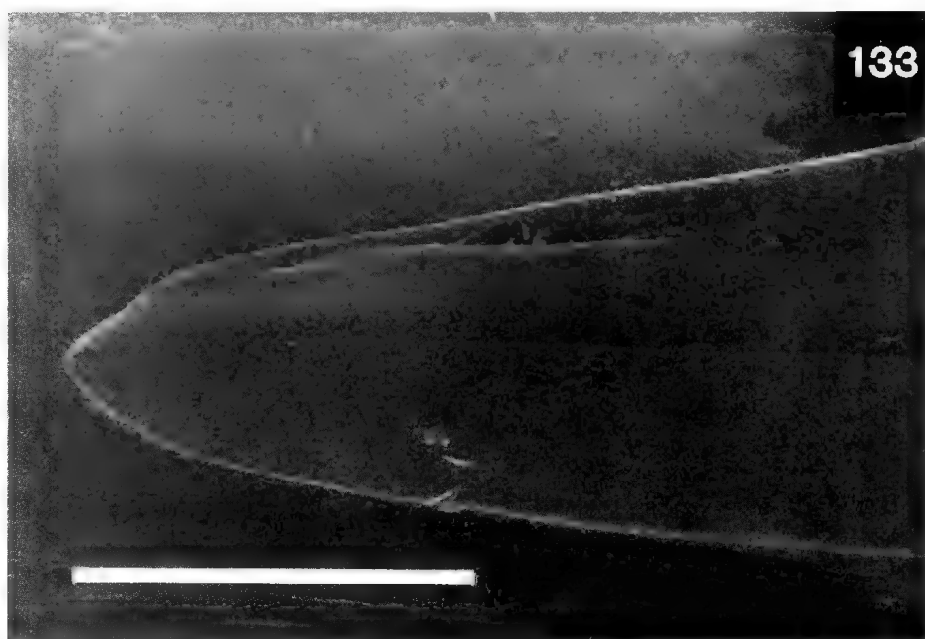
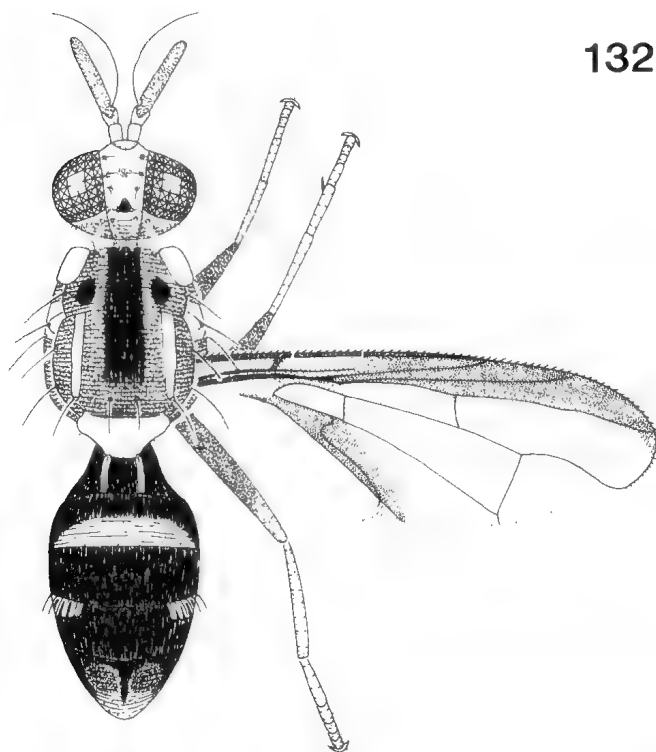


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131

FIG. 130. *Bactrocera* (*Bactrocera*) *unistriata* (Drew), adult male (x9). FIG. 131. *Bactrocera* (*Bactrocera*) *furfurosa* n. sp., adult male (x9).



FIGS 132–133. *Bactrocera* (*Bactrocera*) *nigrovittata* n. sp.: 132, adult male (x10); 133, apex of aculeus (scale 0.1 mm).

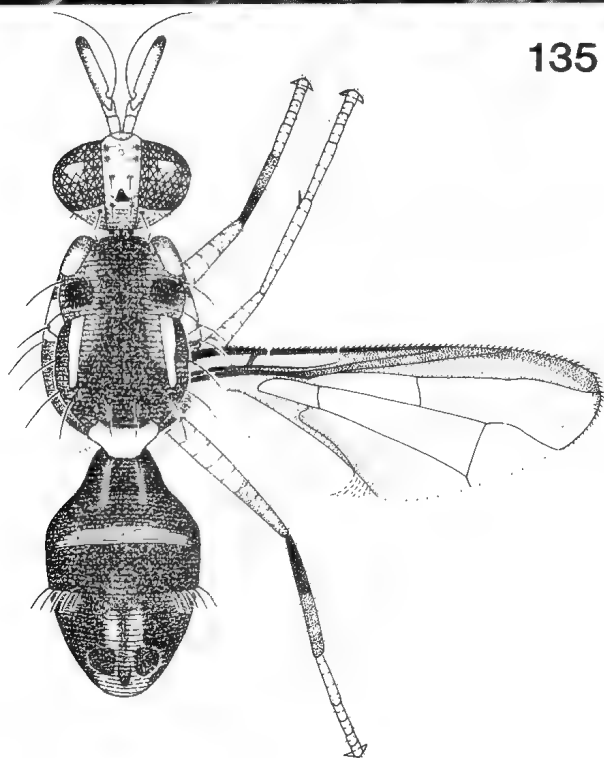
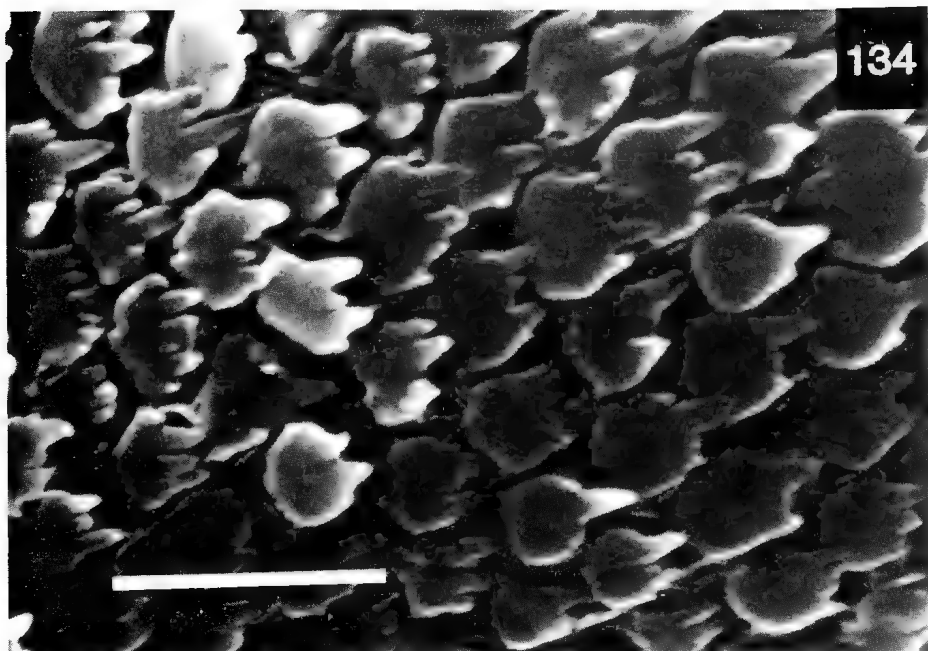
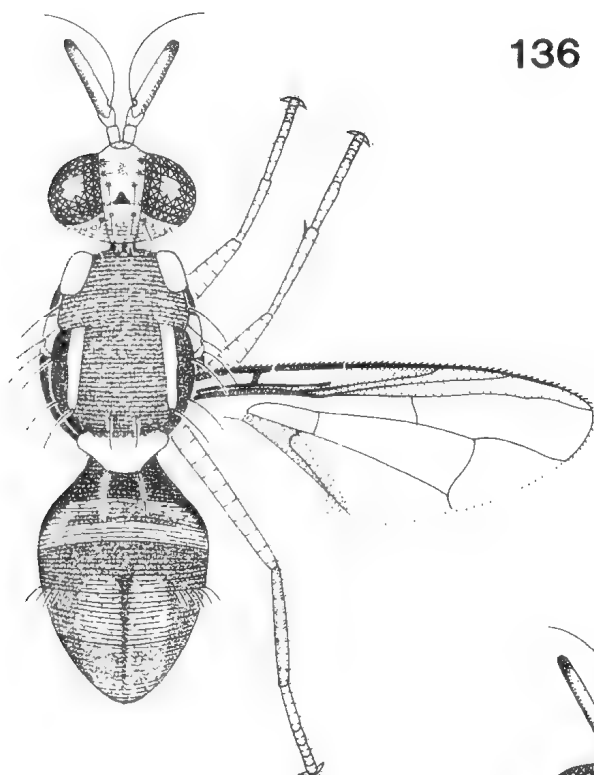
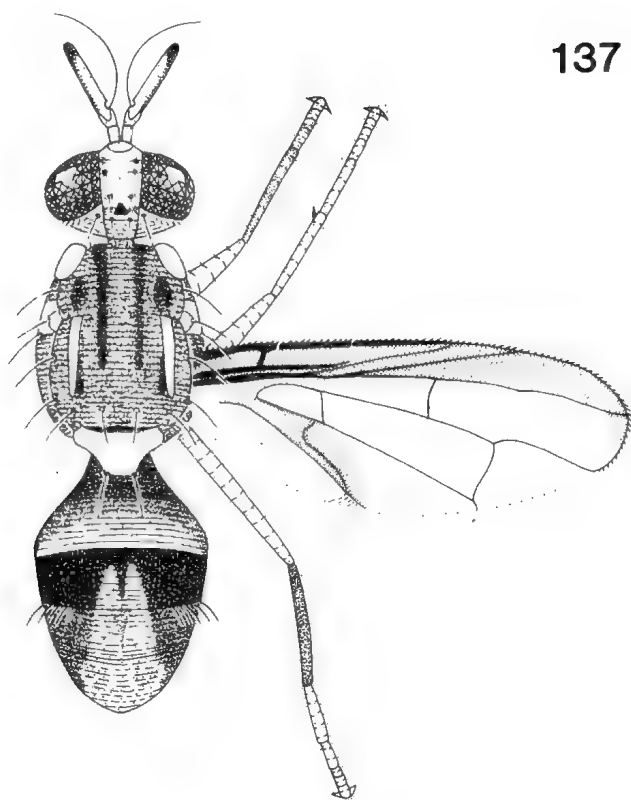


FIG. 134. *Bactrocera (Bactrocera) nigrovittata* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 135. *Bactrocera (Bactrocera) obfuscata* n. sp., adult male (x7).

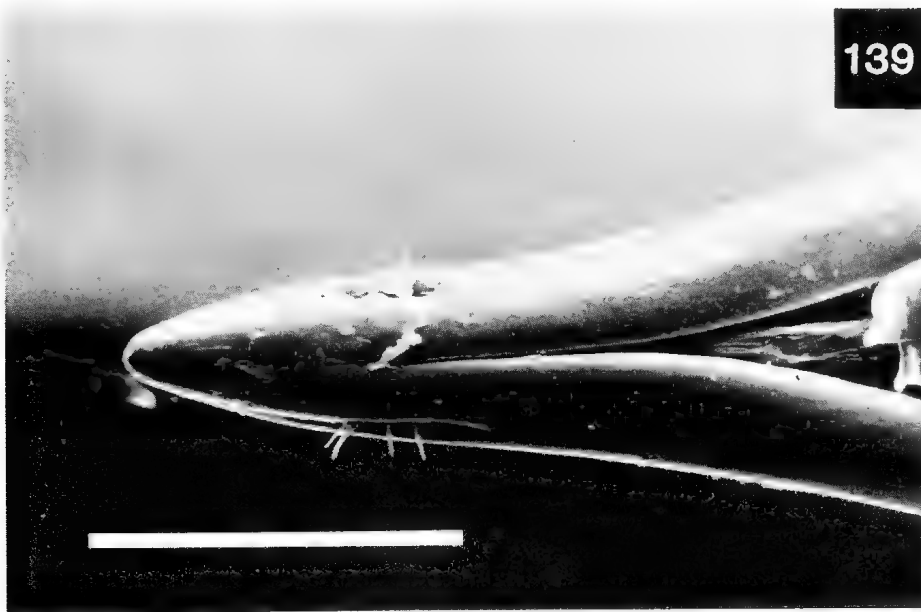
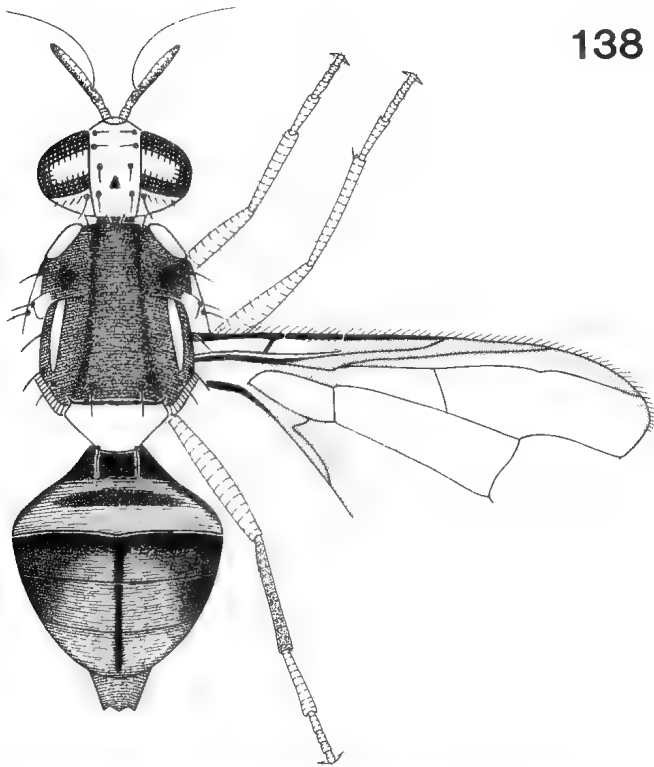


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FIG. 136. *Bactrocera* (*Bactrocera*) *popondettiensis* n. sp., adult male (x9). FIG. 137. *Bactrocera* (*Bactrocera*) *ustulata* n. sp., adult male (x10).



FIGS 138–139. *Bactrocera (Bactrocera) mayi* (Hardy): 138, adult female (x10); 139, apex of aculeus (scale 0.1 mm).

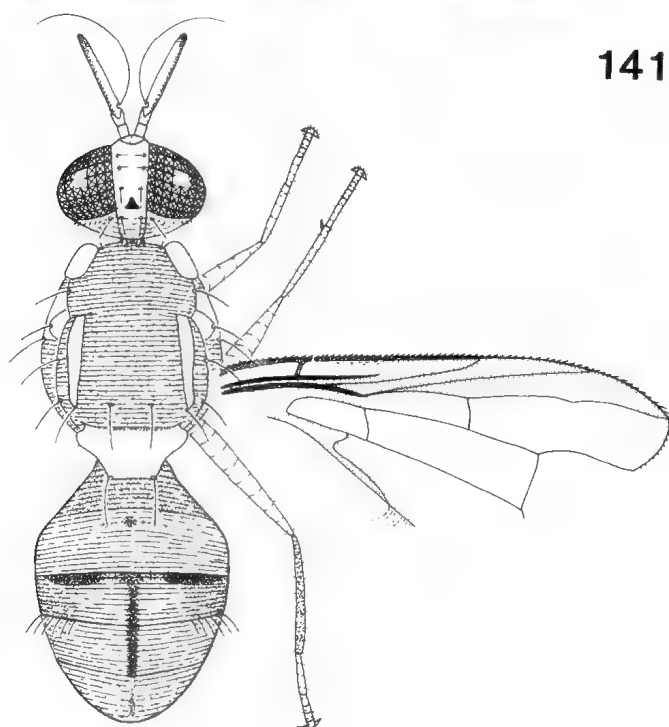
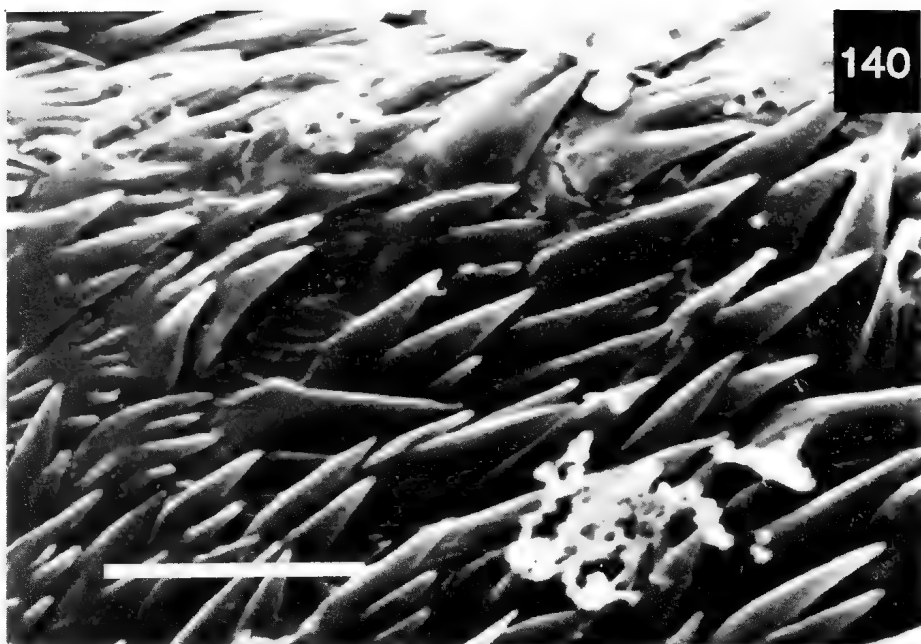
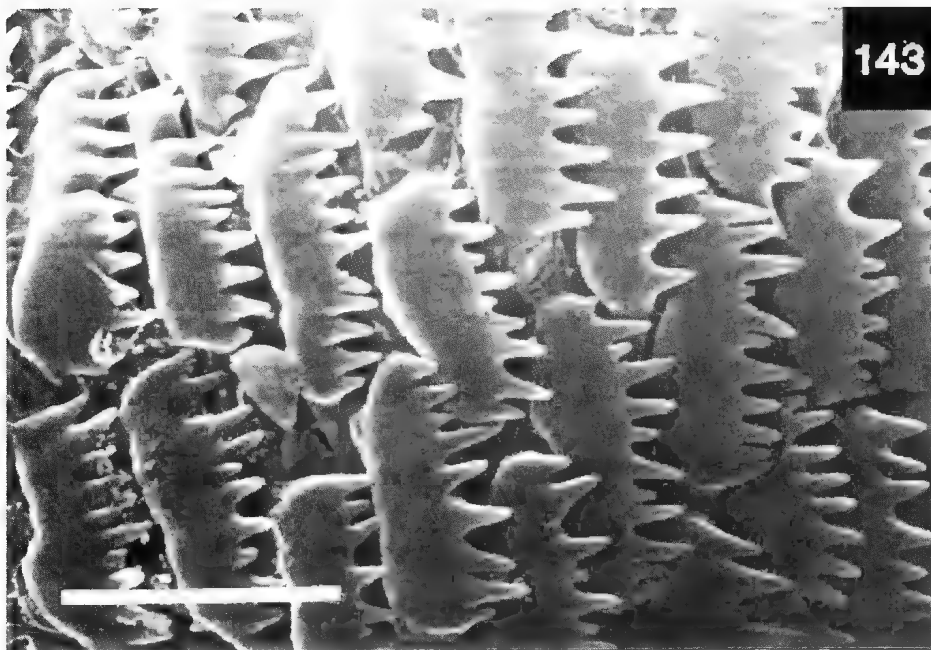
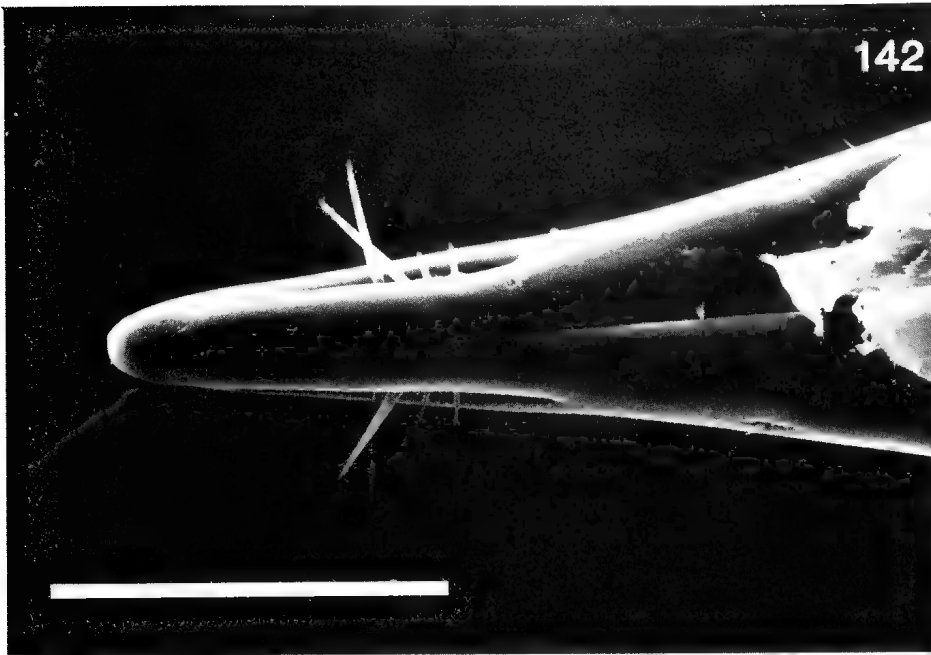
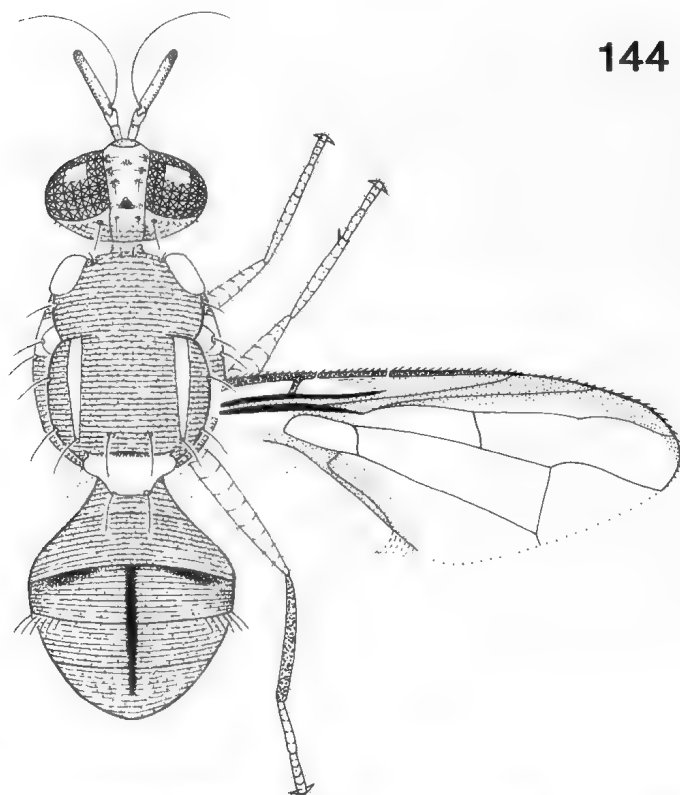


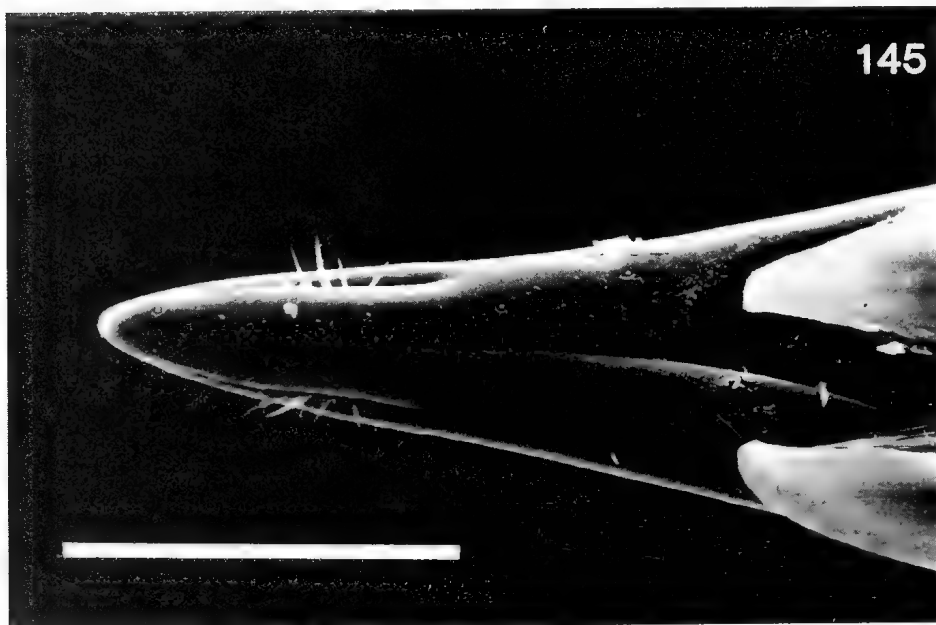
FIG. 140. *Bactrocera* (*Bactrocera*) *mayi* (Hardy), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 141. *Bactrocera* (*Bactrocera*) *pallida* (Perkins and May), adult male (x10).



FIGS 142–143. *Bactrocera* (*Bactrocera*) *pallida* (Perkins and May): 142, apex of aculeus (scale 0.1 mm); 143, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



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FIGS 144–145. *Bactrocera* (*Bactrocera*) *tenuifascia* (May): 144, adult male (x11); 145, apex of aculeus (scale 0.1 mm).

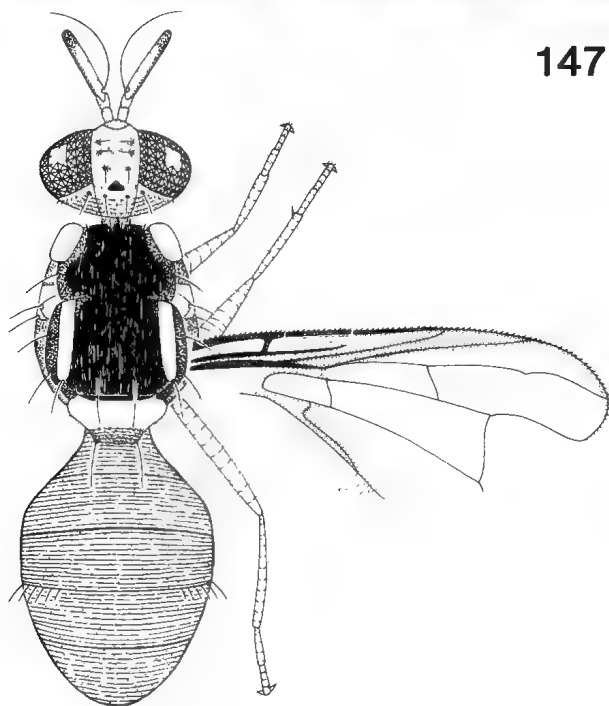
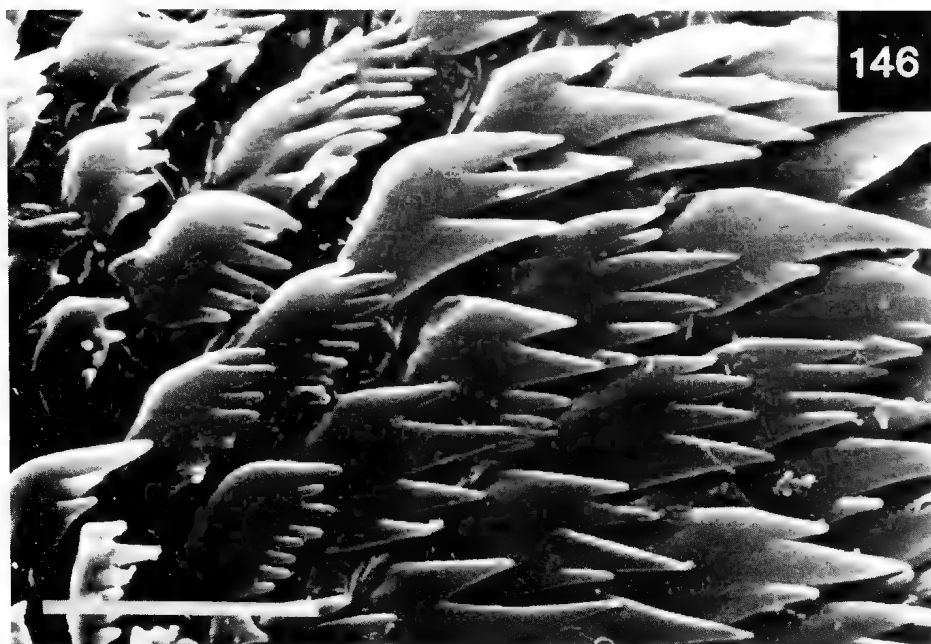
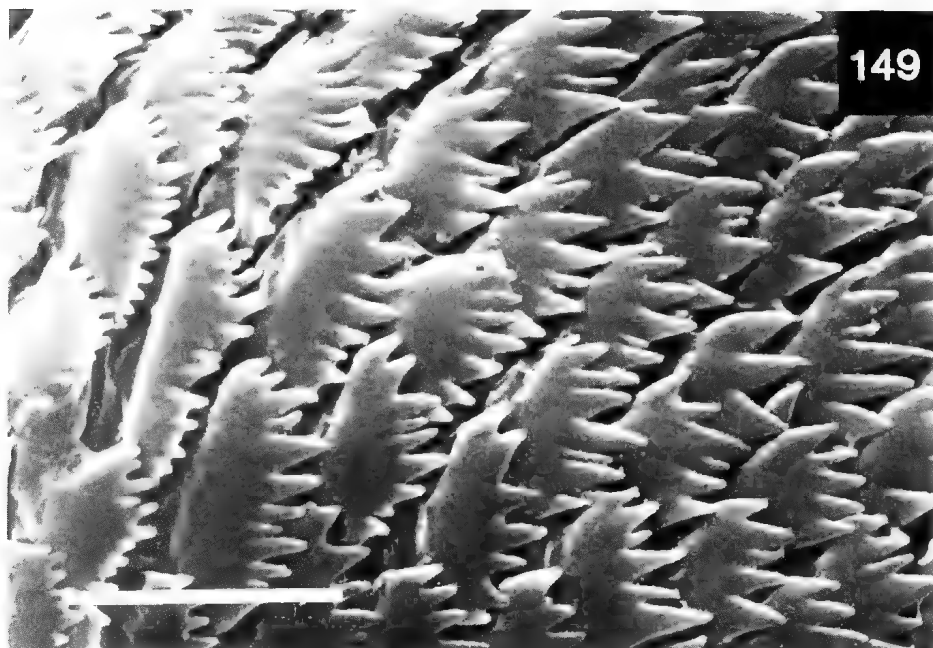
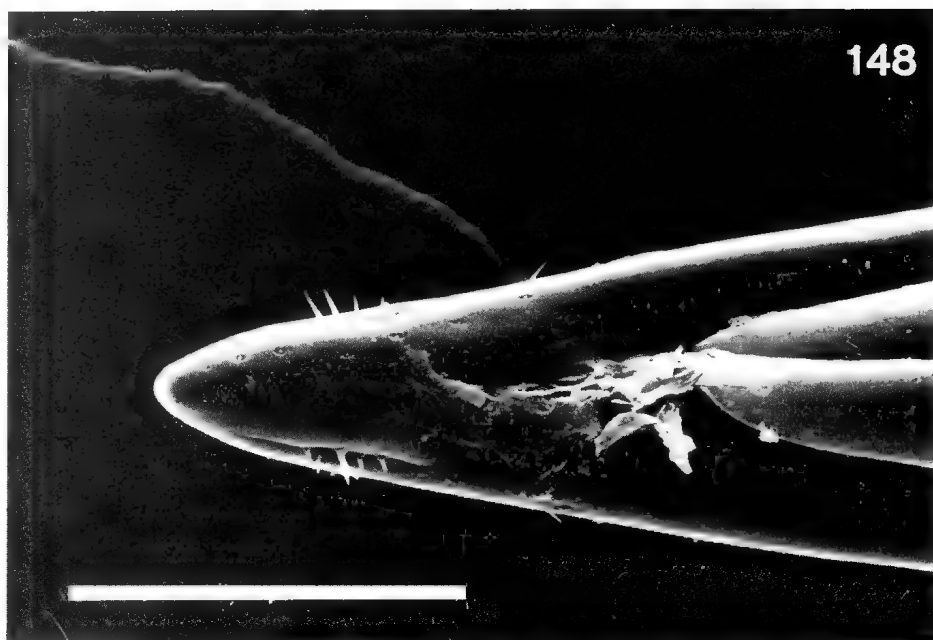


FIG. 146. *Bactrocera* (*Bactrocera*) *tenuifascia* (May), spicules on distal end of middle segment of ovipositor (scale 0.01mm). FIG. 147. *Bactrocera* (*Bactrocera*) *bancroftii* (Tryon), adult male (x9).



FIGS 148–149. *Bactrocera* (*Bactrocera*) *bancroftii* (Tryon): 148, apex of aculeus (scale 0.1 mm); 149, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

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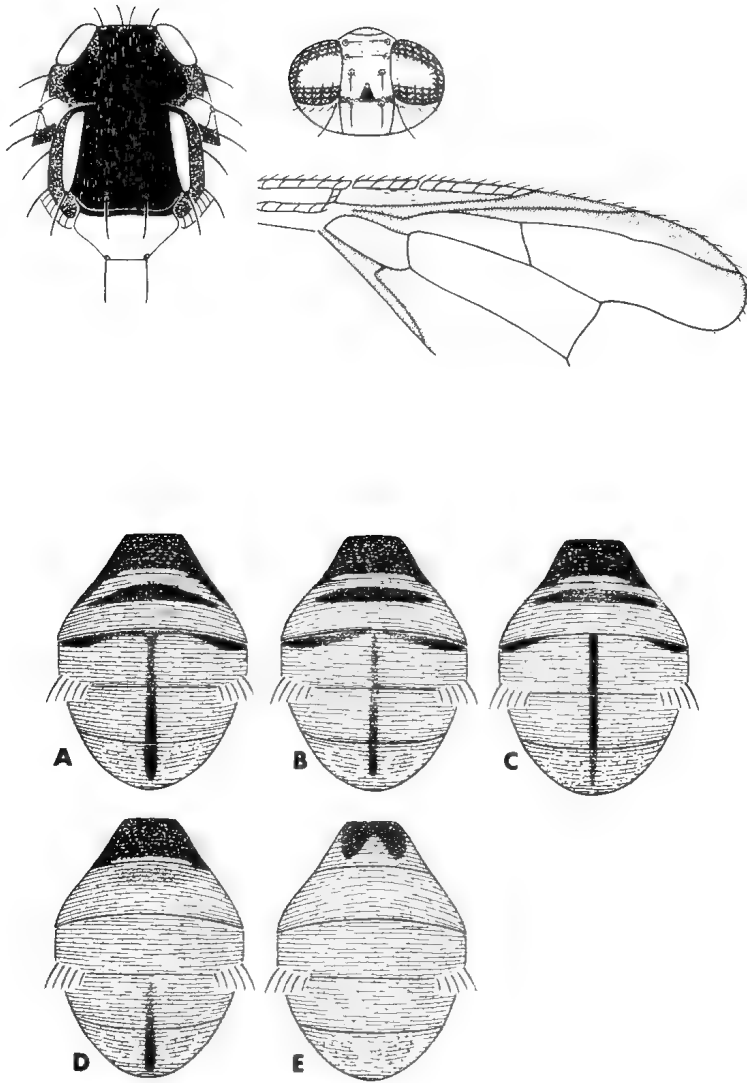
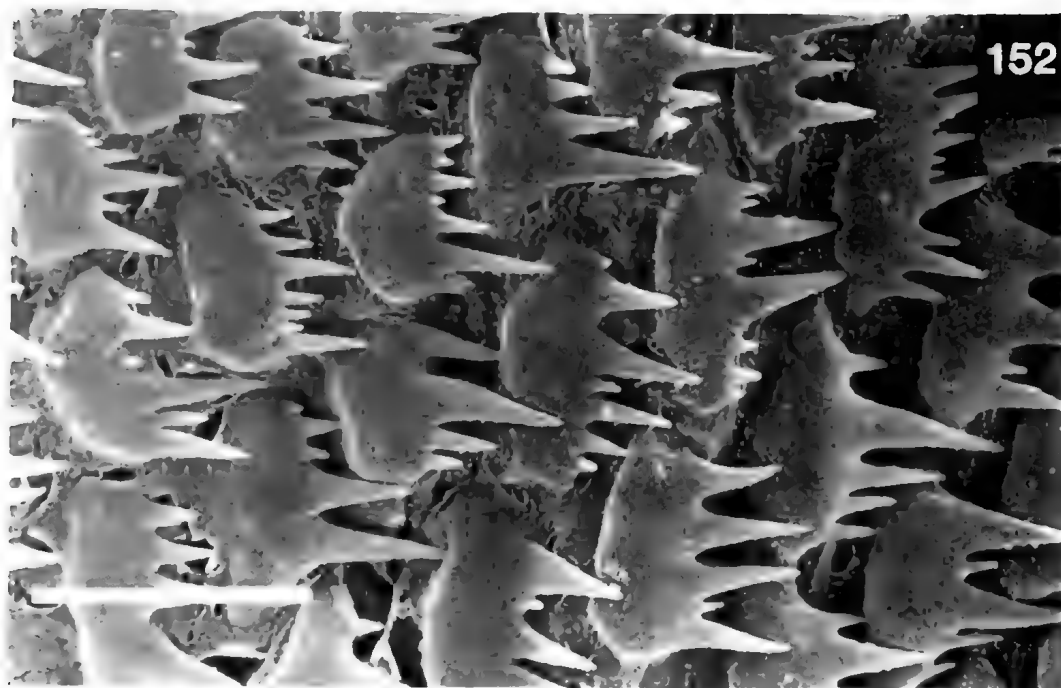
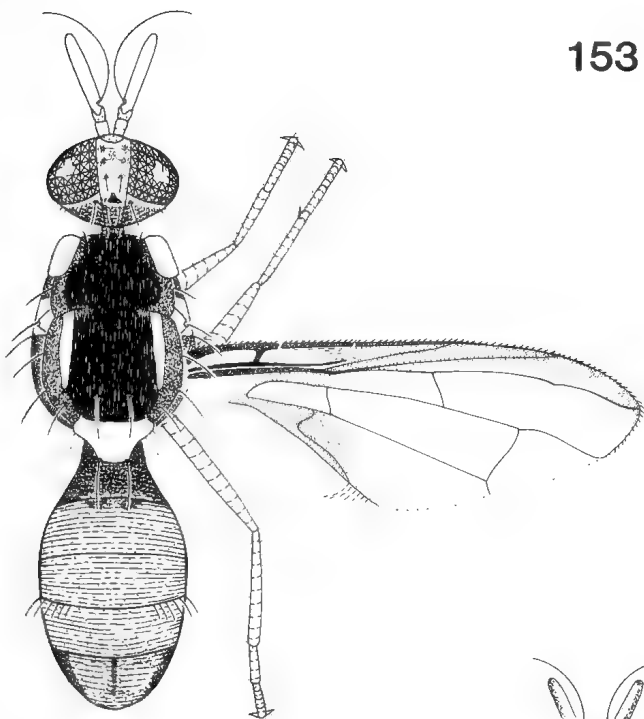


FIG. 150. *Bactrocera* (*Bactrocera*) *musae* (Tryon), adult male (x10). A–E, colour variations of abdomen.



FIGS 151–152. *Bactrocera* (*Bactrocera*) *musae* (Tryon): 151, apex of aculeus (scale 0.01 mm); 152, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

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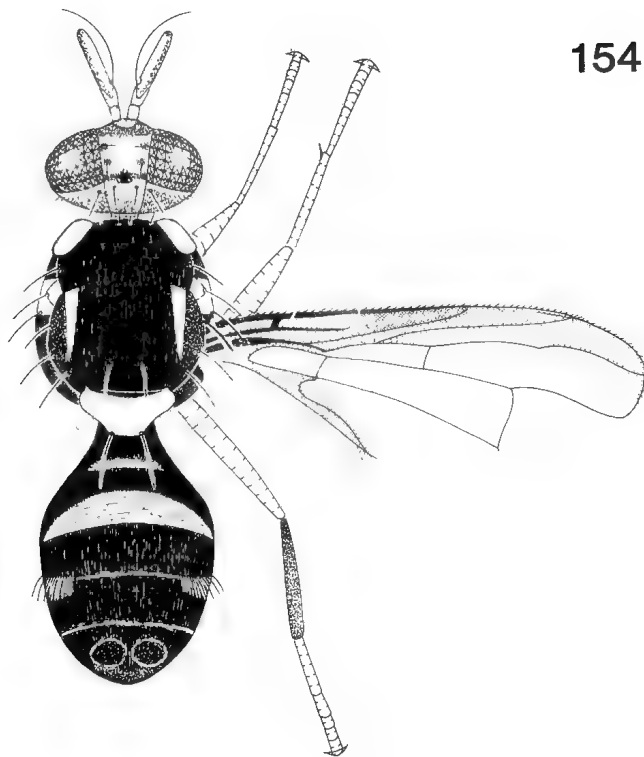
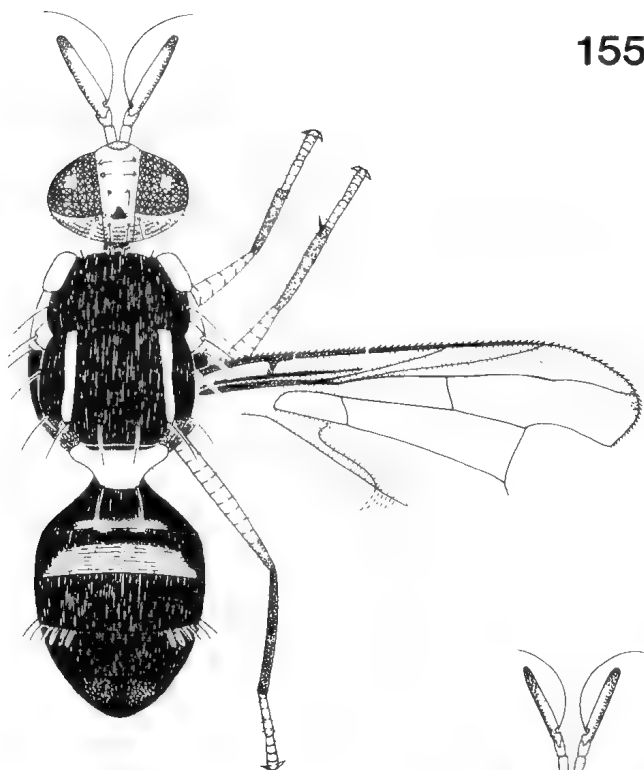
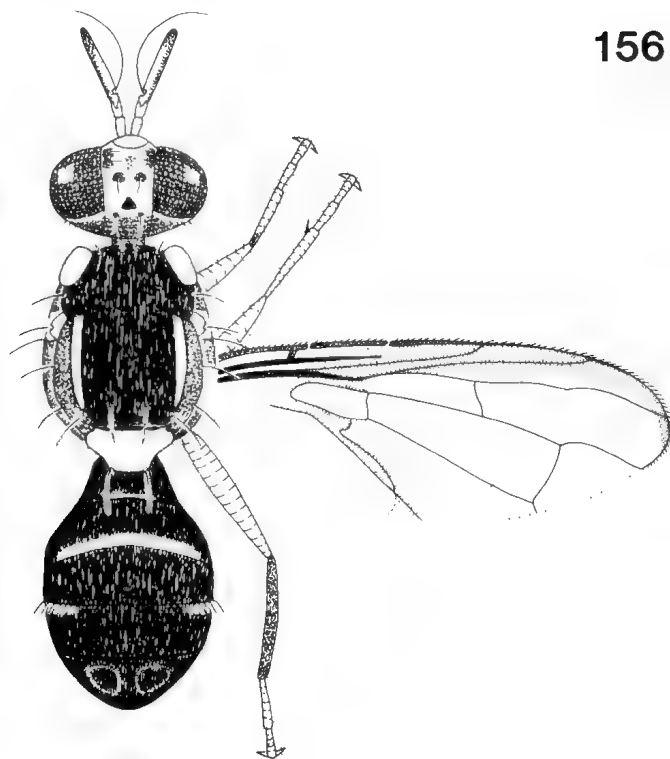


FIG. 153. *Bactrocera (Bactrocera) prolixa* n. sp., adult male (x8). FIG. 154. *Bactrocera (Bactrocera) batemani* n. sp., adult male (x9).

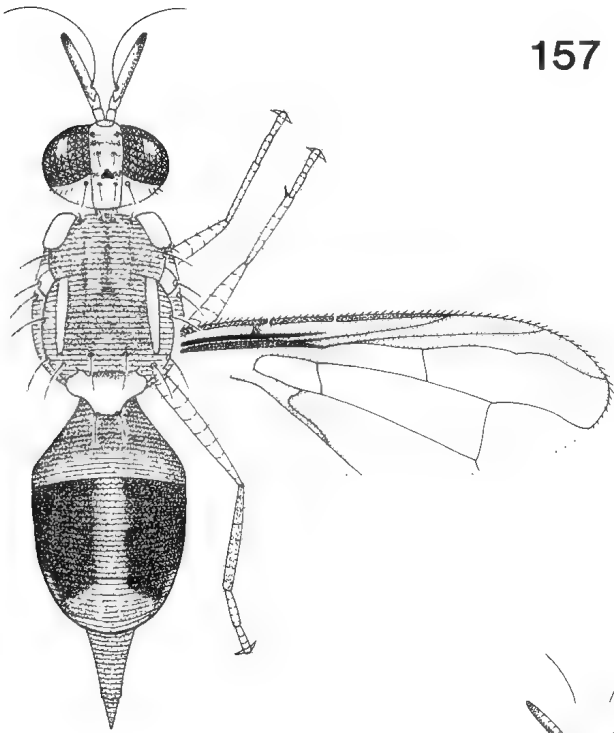


155

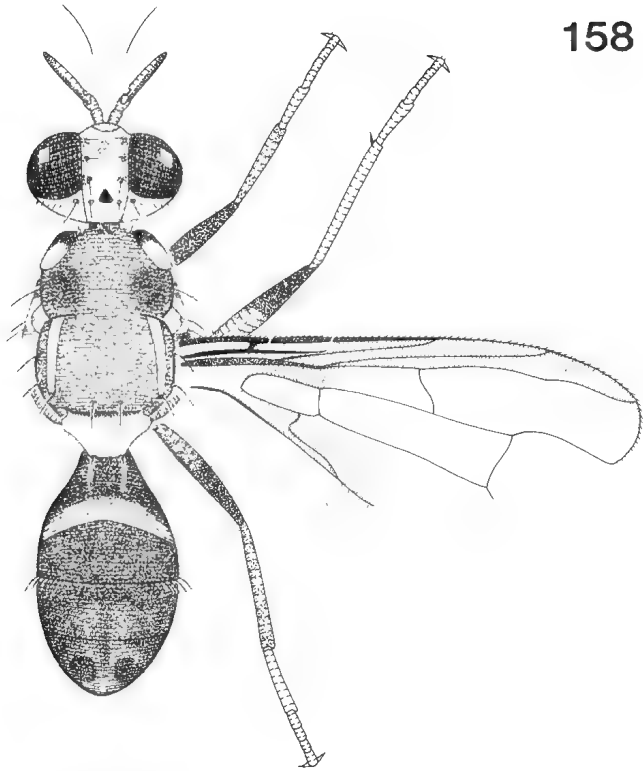


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FIG. 155. *Bactrocera* (*Bactrocera*) *kelaena* n. sp., adult male (x11). FIG. 156. *Bactrocera* (*Bactrocera*) *nigella* (Drew), adult male (x8).

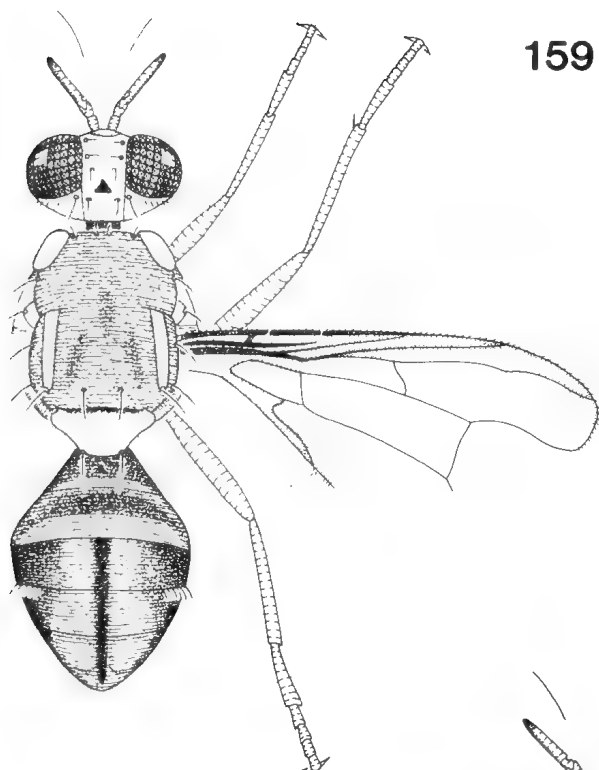


157

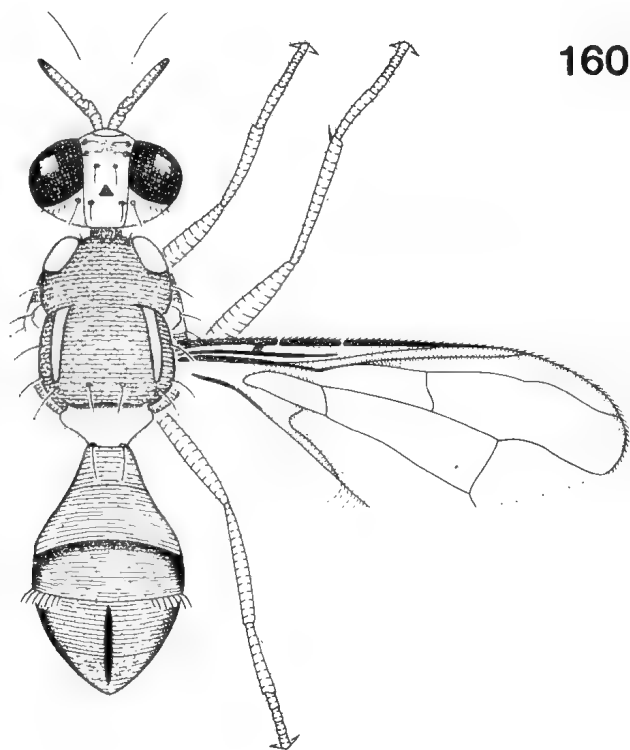


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FIG. 157. *Bactrocera (Bactrocera) notatagena* (May), adult female (x11). FIG. 158. *Bactrocera (Bactrocera) romigae* (Drew and Hancock), adult male (x9).

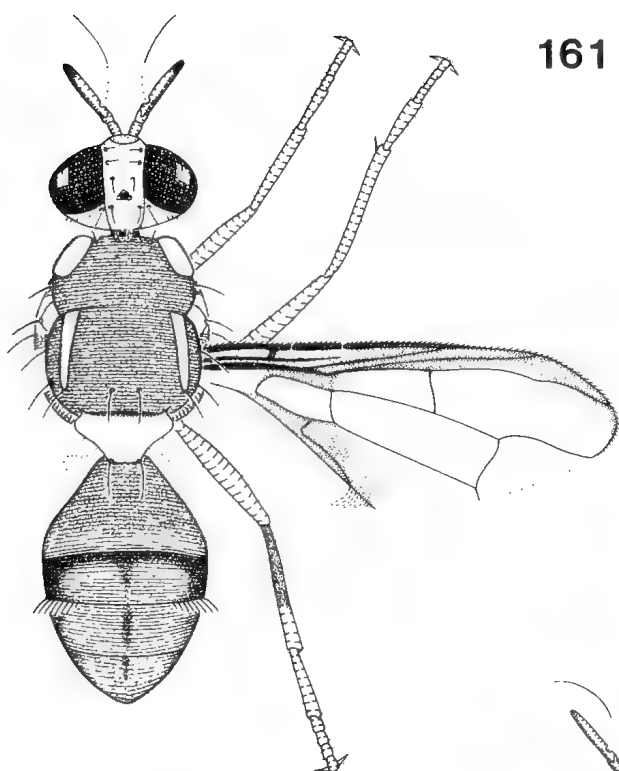


159

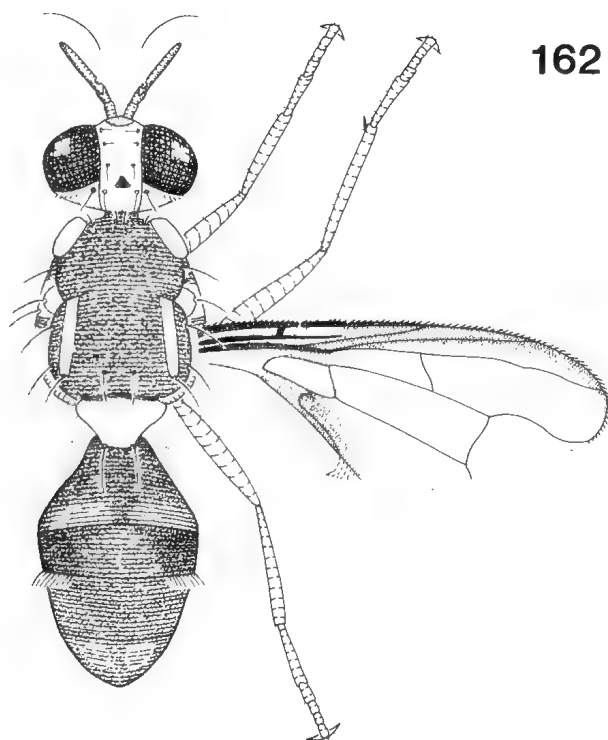


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FIG. 159. *Bactrocera* (*Bactrocera*) *antigone* (Drew and Hancock), adult male (x10). FIG. 160. *Bactrocera* (*Bactrocera*) *aurantiaca* (Drew and Hancock), adult male (x10).

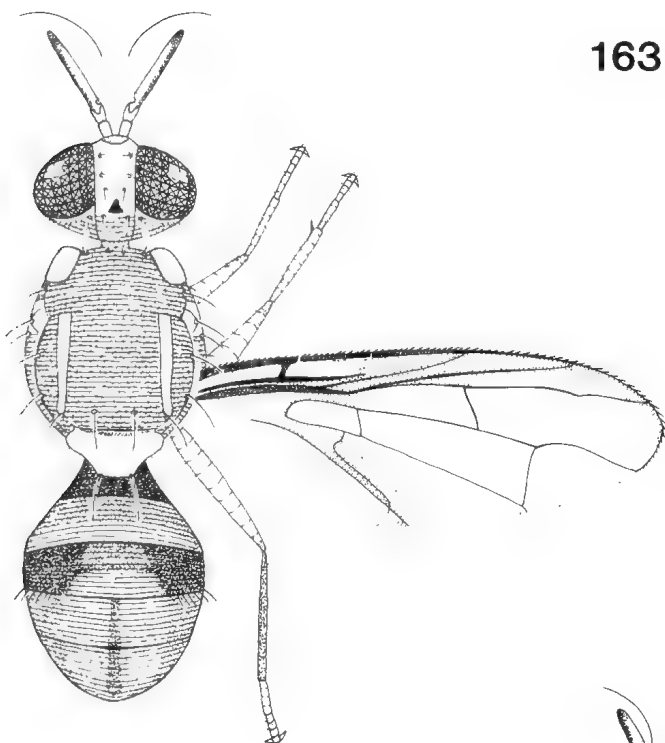


161

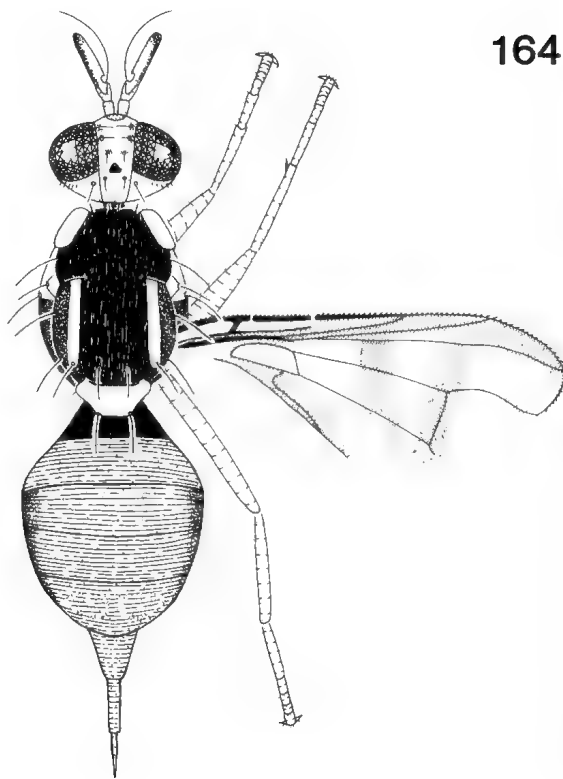


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FIG. 161. *Bactrocera* (*Bactrocera*) *erubescens* (Drew and Hancock), adult male (x11). FIG. 162. *Bactrocera* (*Bactrocera*) *peninsularis* (Drew and Hancock), adult male (x10).

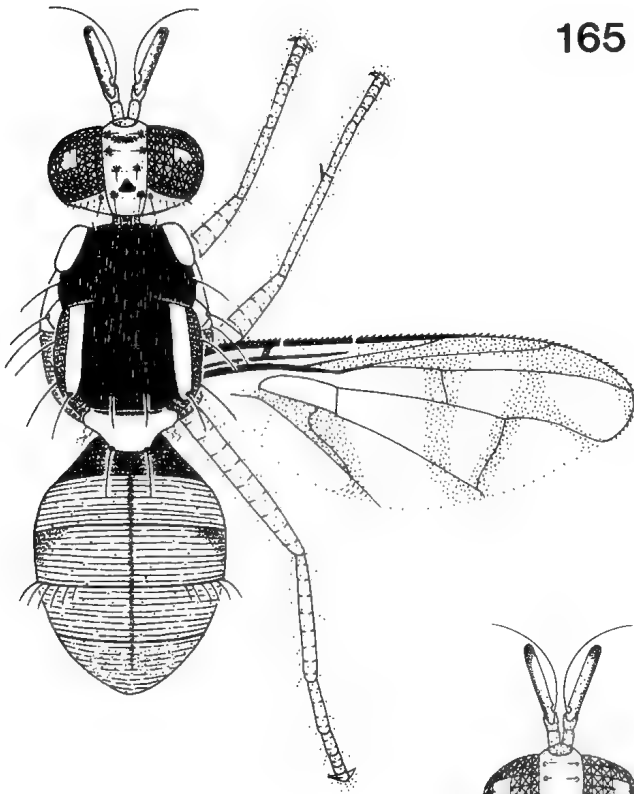


163

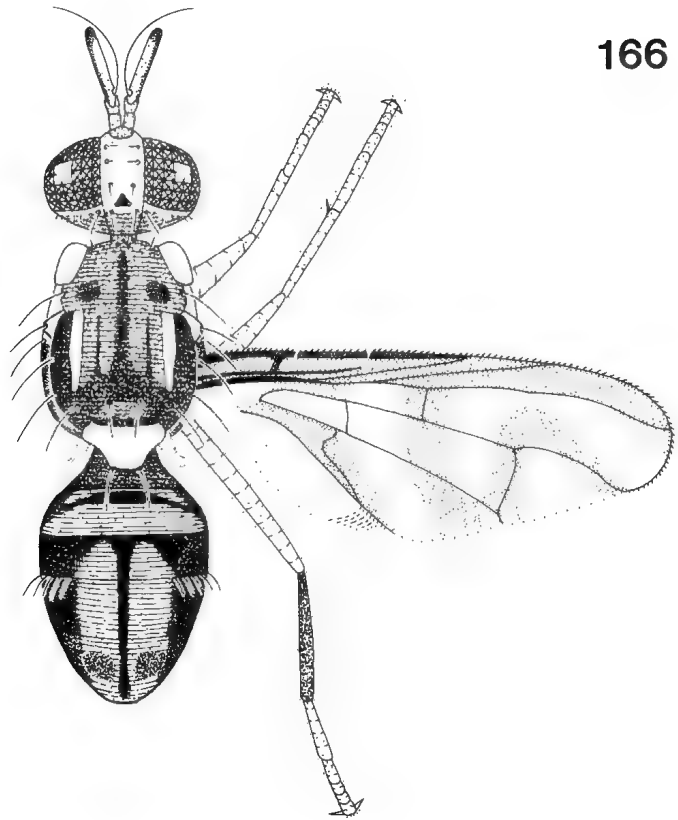


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FIG. 163. *Bactrocera* (*Bactrocera*) *quadrata* (May), adult male (x10). FIG. 164. *Bactrocera* (*Bactrocera*) *absidata* n. sp., adult female (x7).

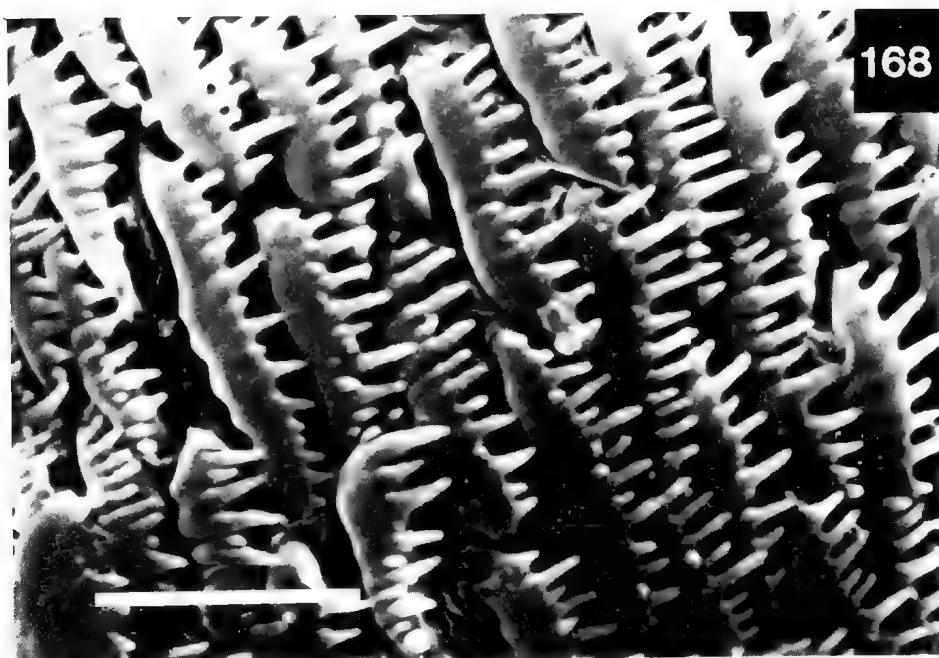
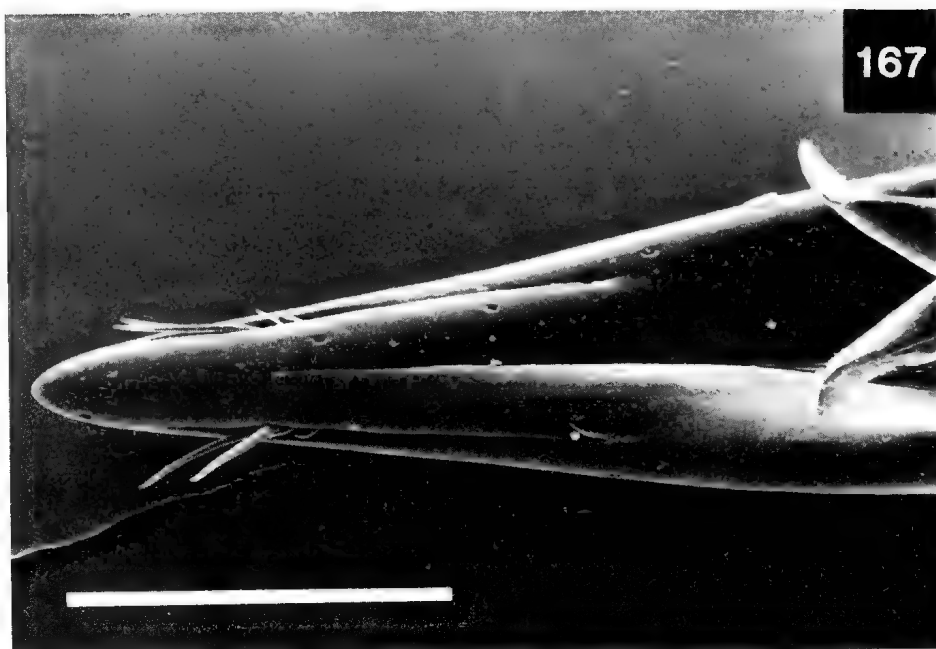


165

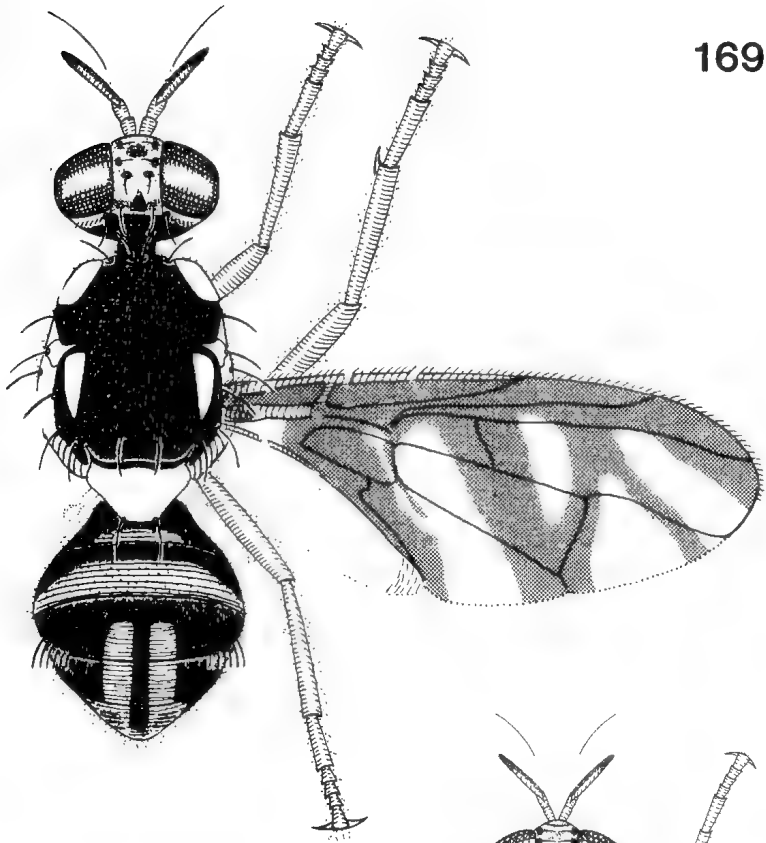


166

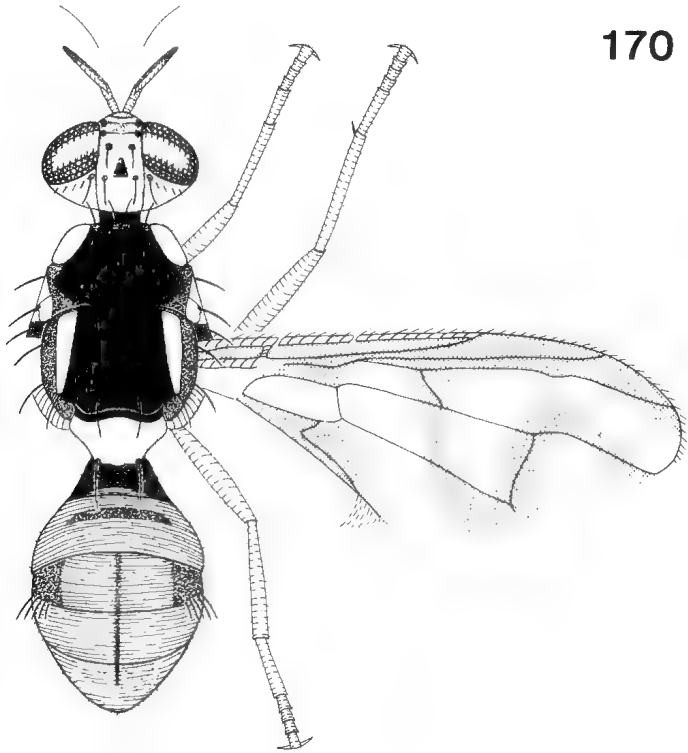
FIG. 165. *Bactrocera (Bactrocera) anfracta* n. sp., adult male (x9). FIG. 166. *Bactrocera (Bactrocera) manskii* (Perkins and May), adult male (x11).



FIGS 167–168. *Bactrocera* (*Bactrocera*) *manskii* (Perkins and May): 167, apex of aculeus (scale 0.1 mm); 168, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

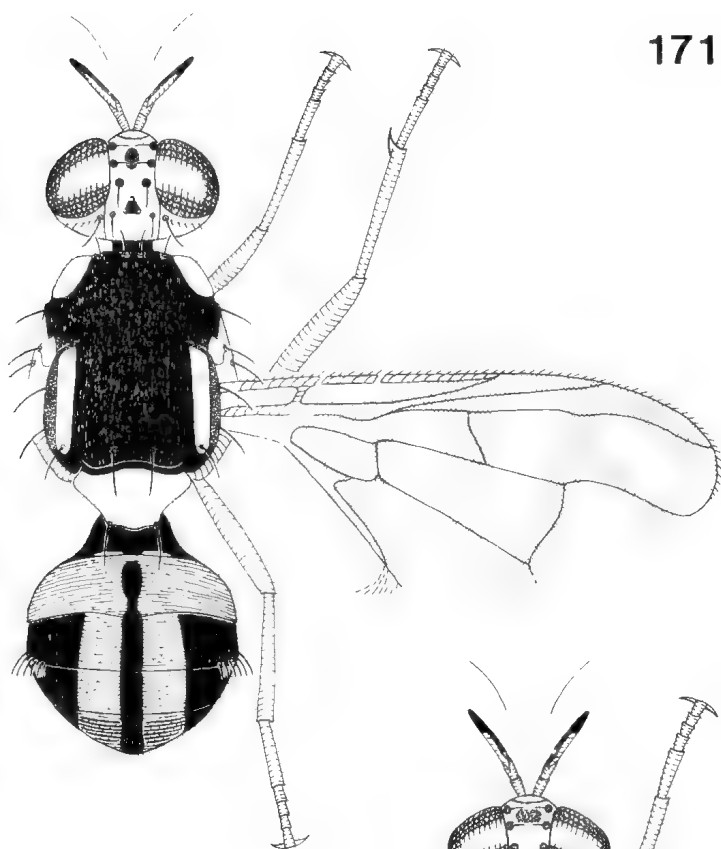


169

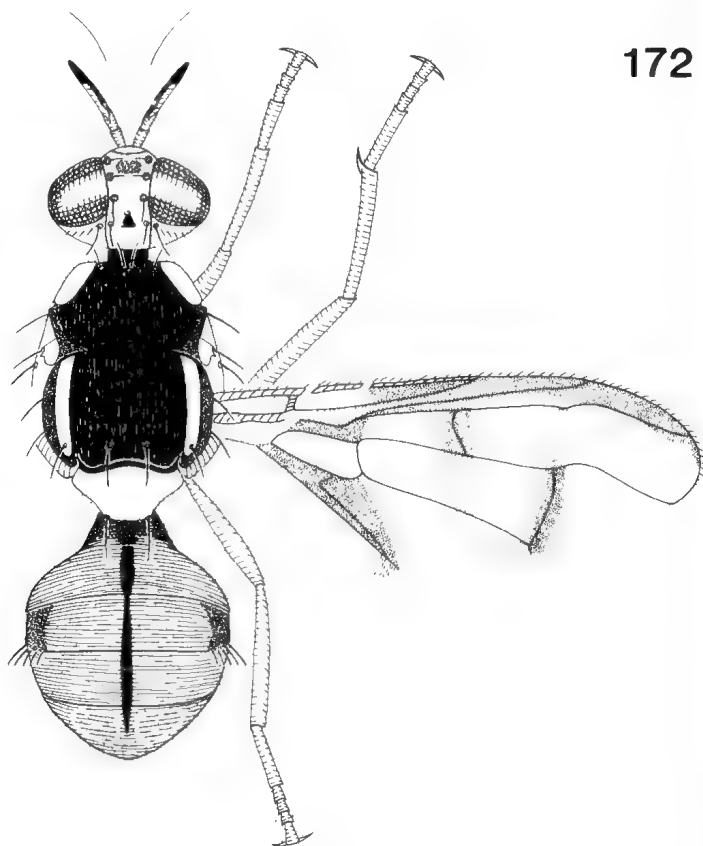


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FIG. 169. *Bactrocera* (*Bactrocera*) *nigrescentis* (Drew), adult male (x14). FIG. 170. *Bactrocera* (*Bactrocera*) *recurrens* (Hering), adult male (x12).



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FIG. 171. *Bactrocera* (*Bactrocera*) *redunca* (Drew), adult male (x9). FIG. 172. *Bactrocera* (*Bactrocera*) *resima* (Drew), adult male (x9).

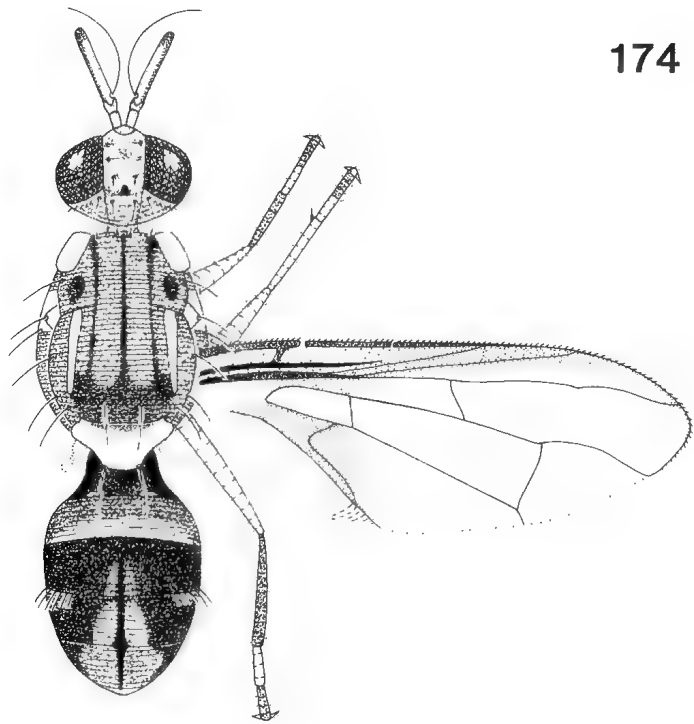
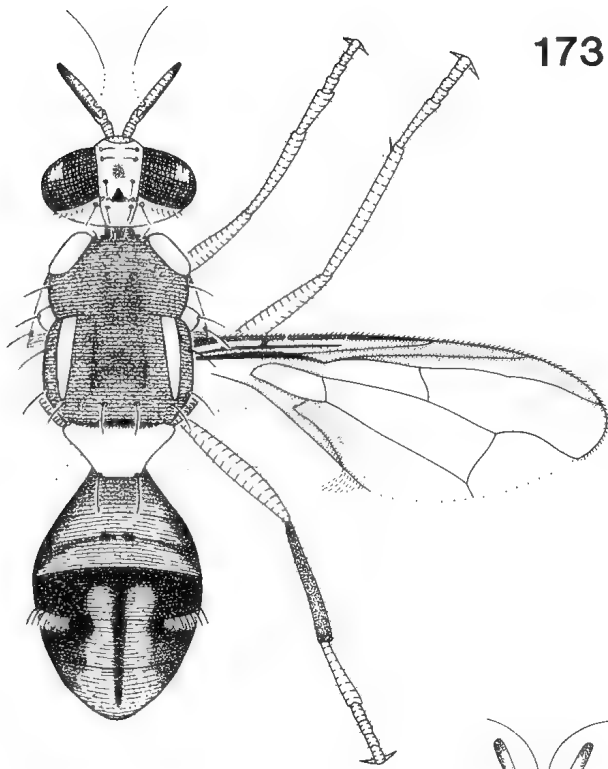
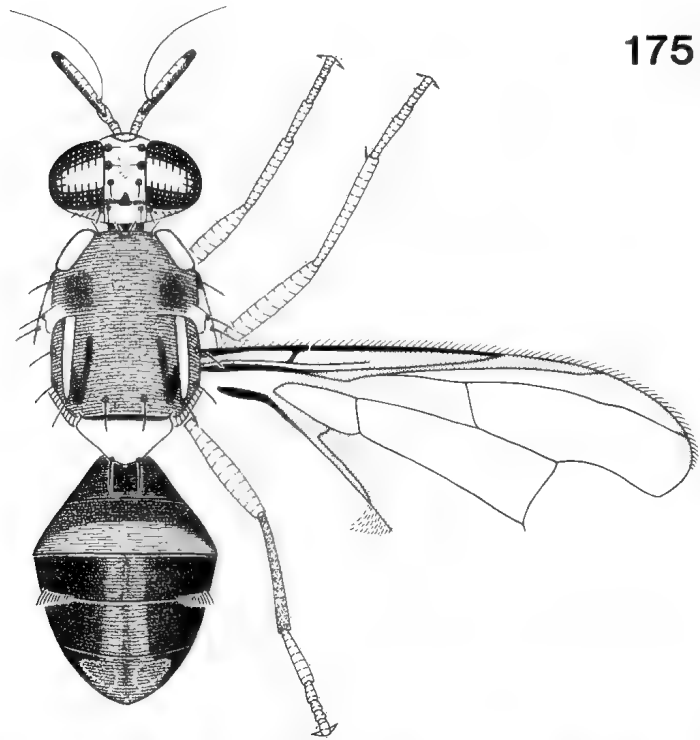
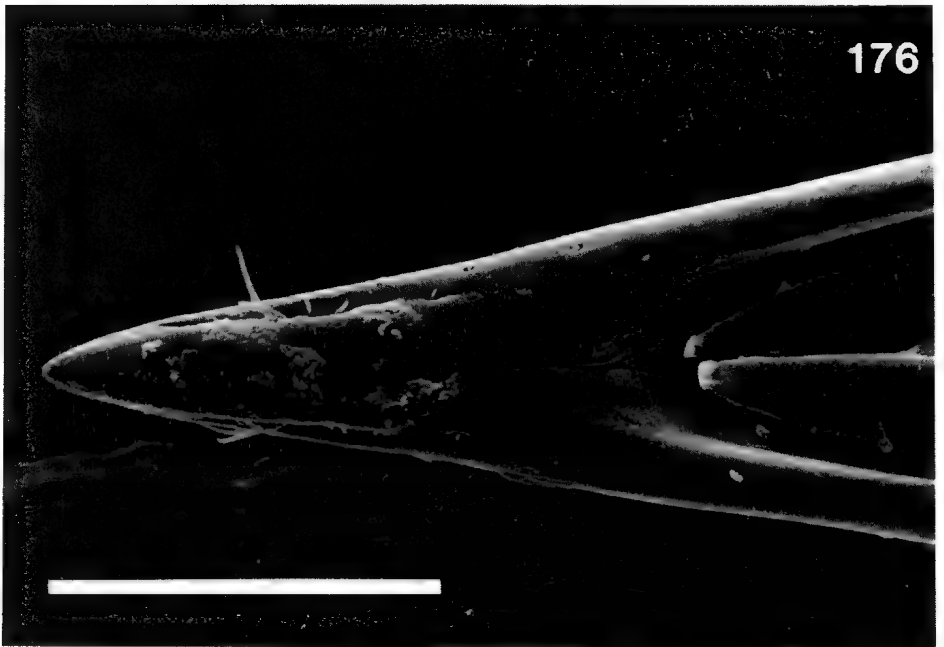


FIG. 173. *Bactrocera (Bactrocera) abscondita* (Drew and Hancock), adult male (x9). FIG. 174. *Bactrocera (Bactrocera) abundans* n. sp., adult male (x9).



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FIGS 175–176. *Bactrocera* (*Bactrocera*) *breviaculeus* (Hardy): 175, adult male (x11); 176, apex of aculeus (scale 0.1 mm).

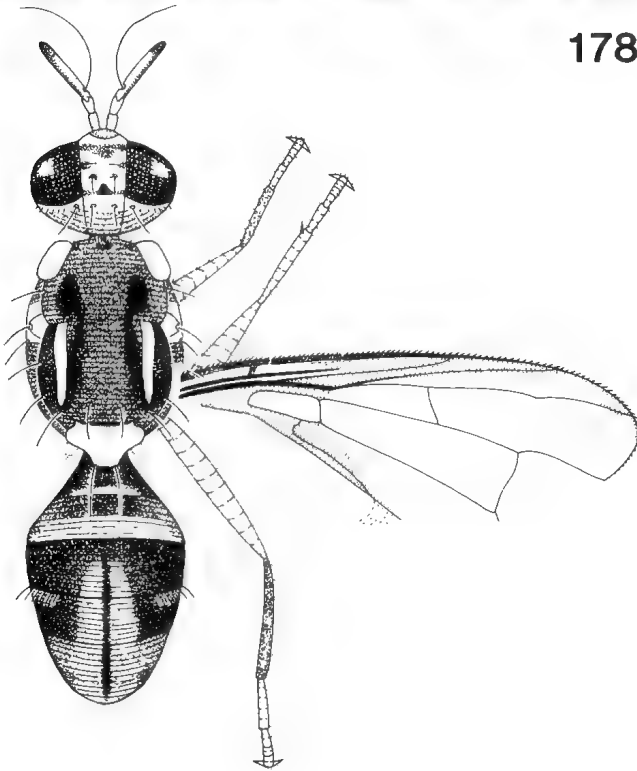
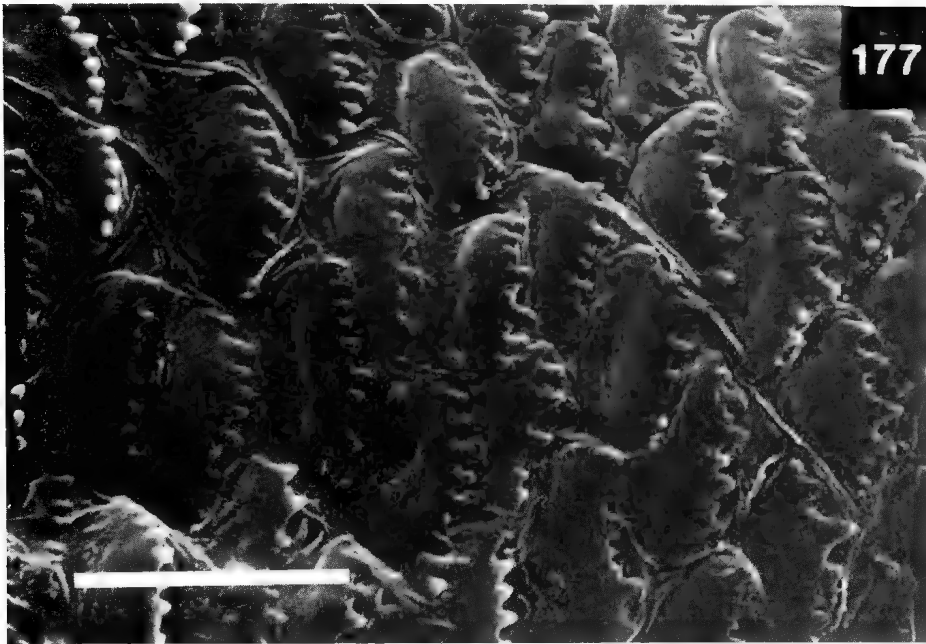
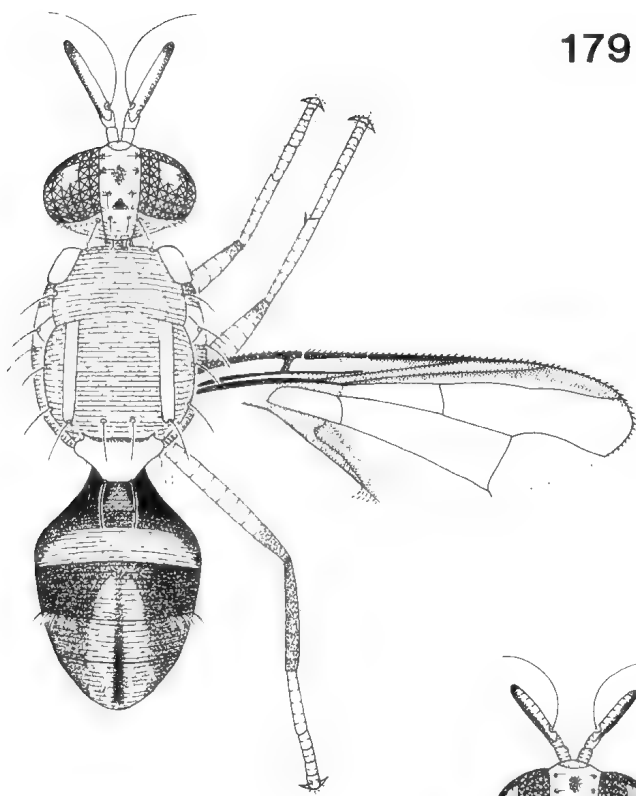
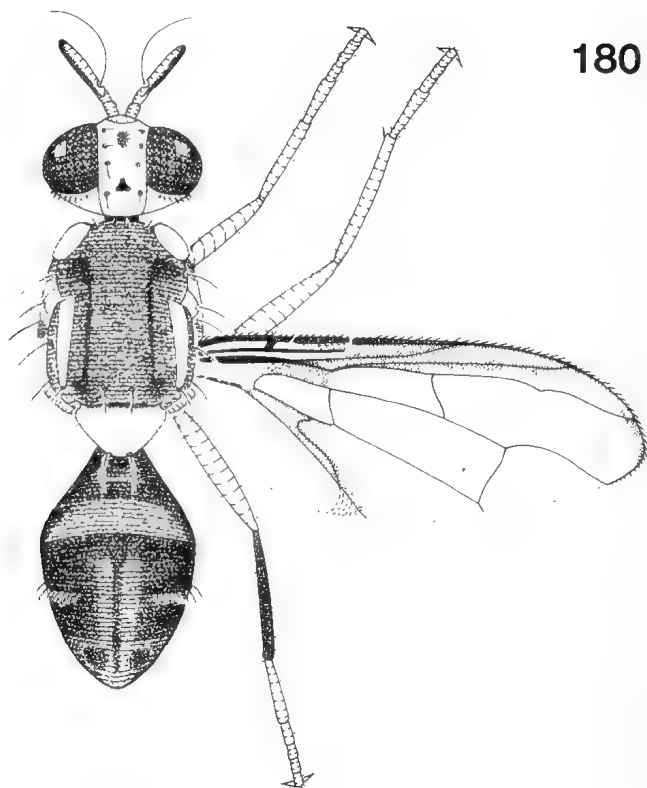


FIG. 177. *Bactrocera* (*Bactrocera*) *breviaculeus* (Hardy), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 178. *Bactrocera* (*Bactrocera*) *cinnamea* n. sp., adult male (x9).

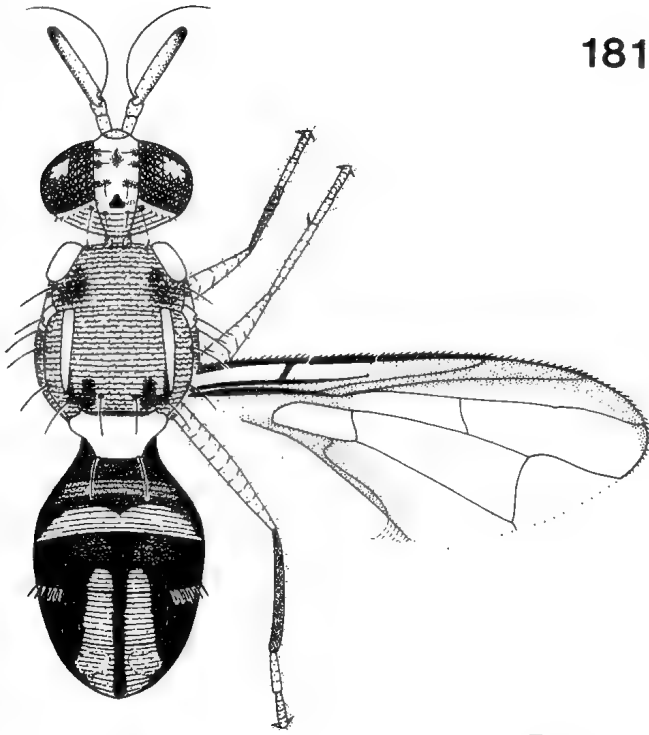


179

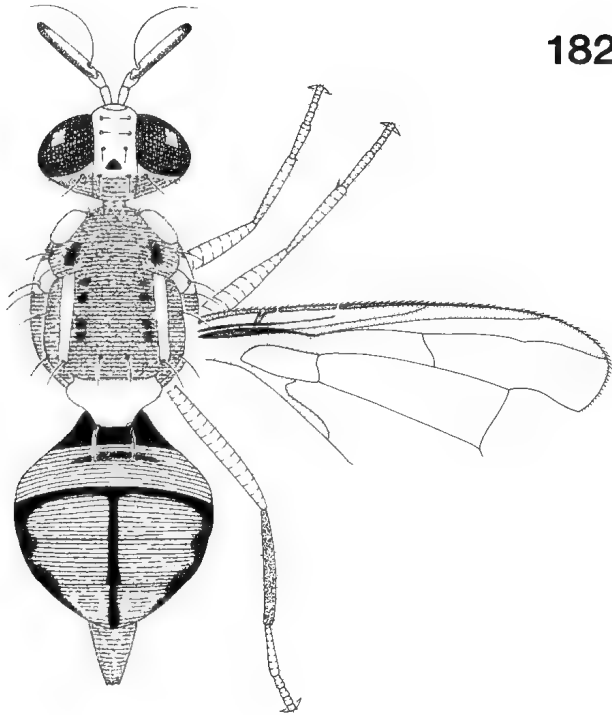


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FIG. 179. *Bactrocera* (*Bactrocera*) *quasisilvicola* n. sp., adult male (x10). FIG. 180. *Bactrocera* (*Bactrocera*) *rufofuscula* (Drew and Hancock), adult male (x11).

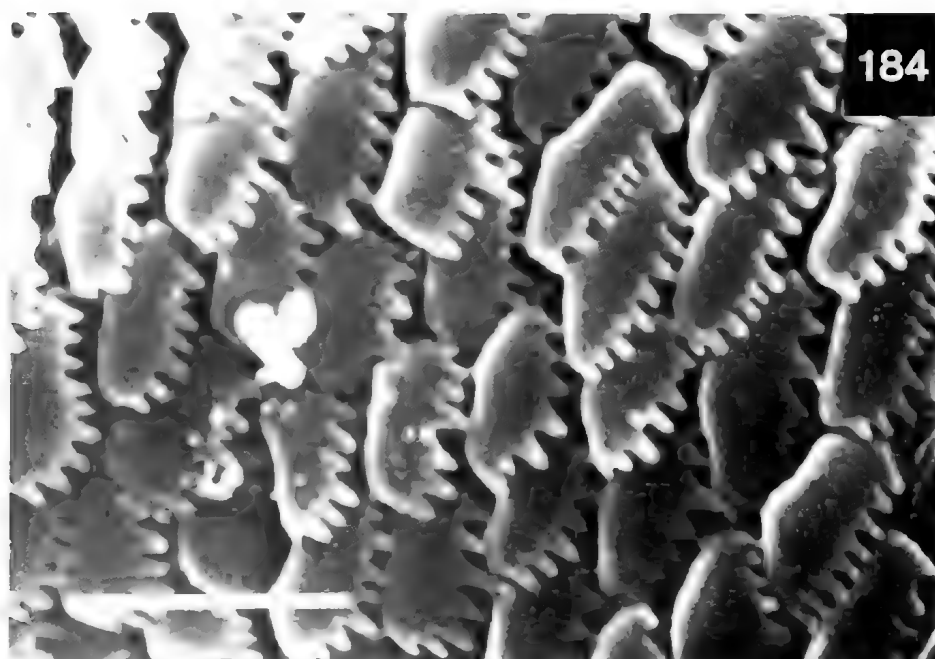
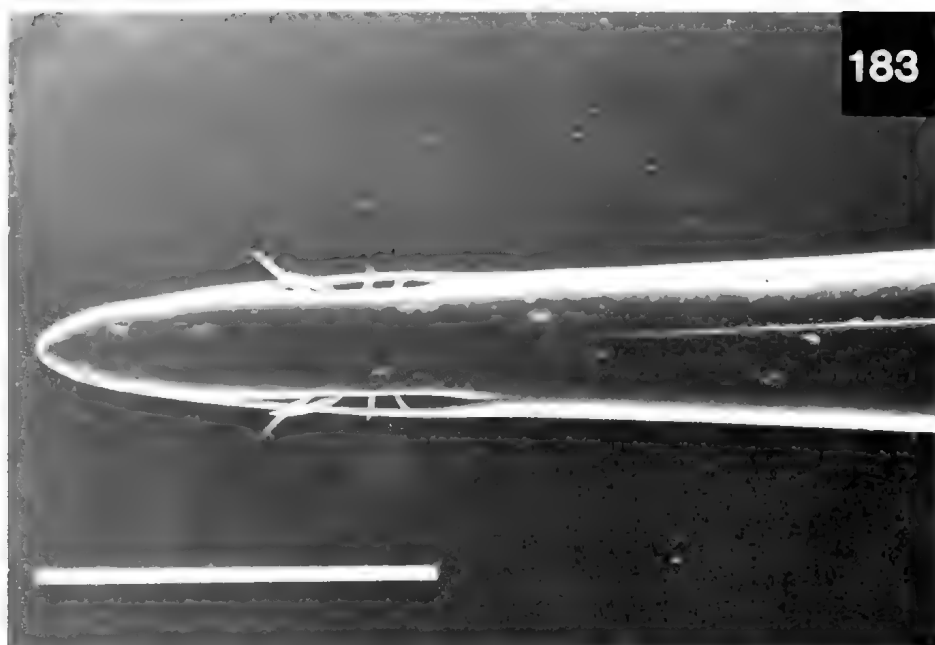


181

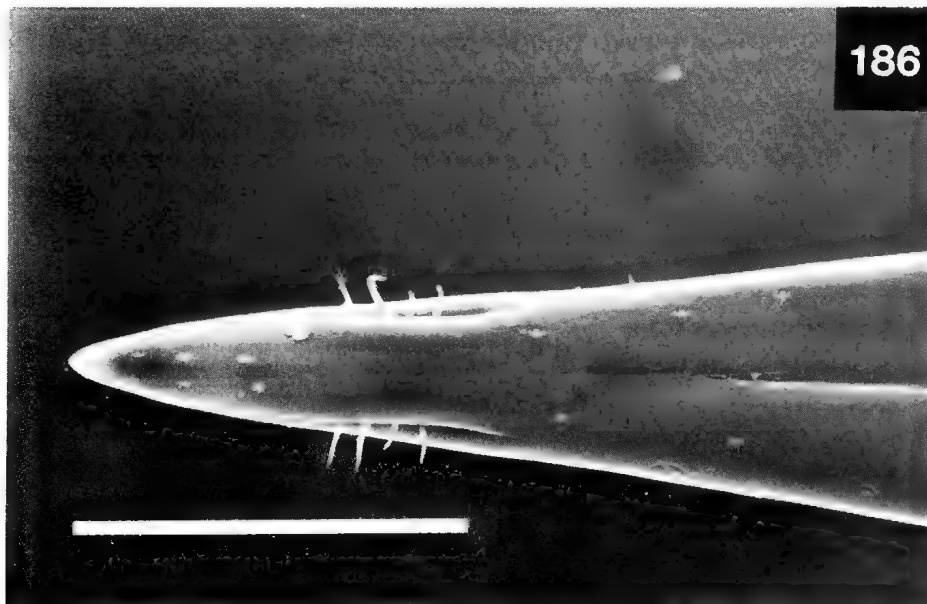
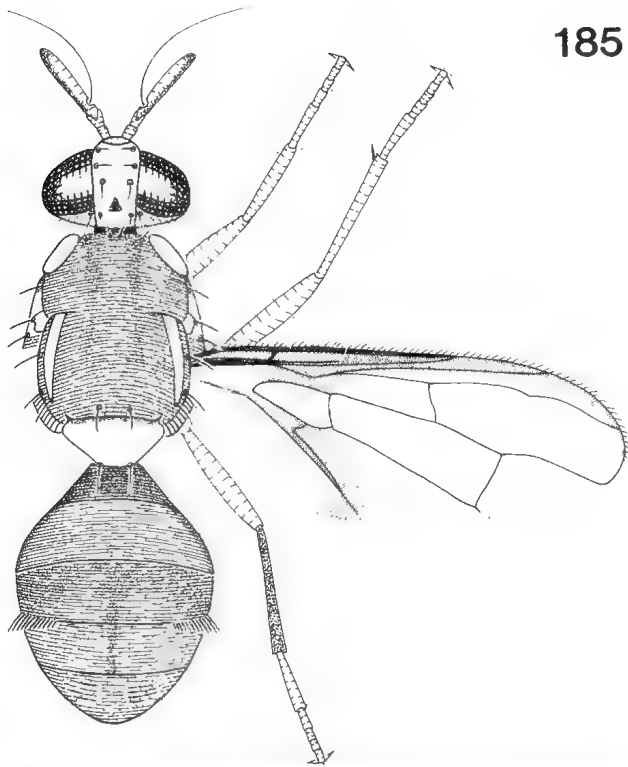


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FIG. 181. *Bactrocera* (*Bactrocera*) *silvicola* (May), adult male (x12). FIG. 182. *Bactrocera* (*Bactrocera*) *turneri* n. sp., adult female (x8).



FIGS 183–184. *Bactrocera (Bactrocera) turneri* n. sp.: 183, apex of aculeus (scale 0.1 mm); 184, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 185–186. *Bactrocera* (*Bactrocera*) *aquilonis* (May): 185, adult male (x10); 186, apex of aculeus (scale 0.1 mm).

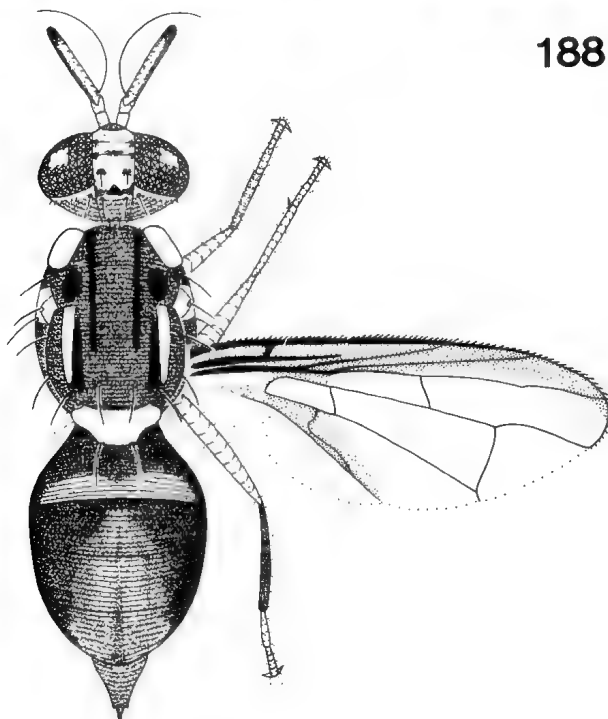
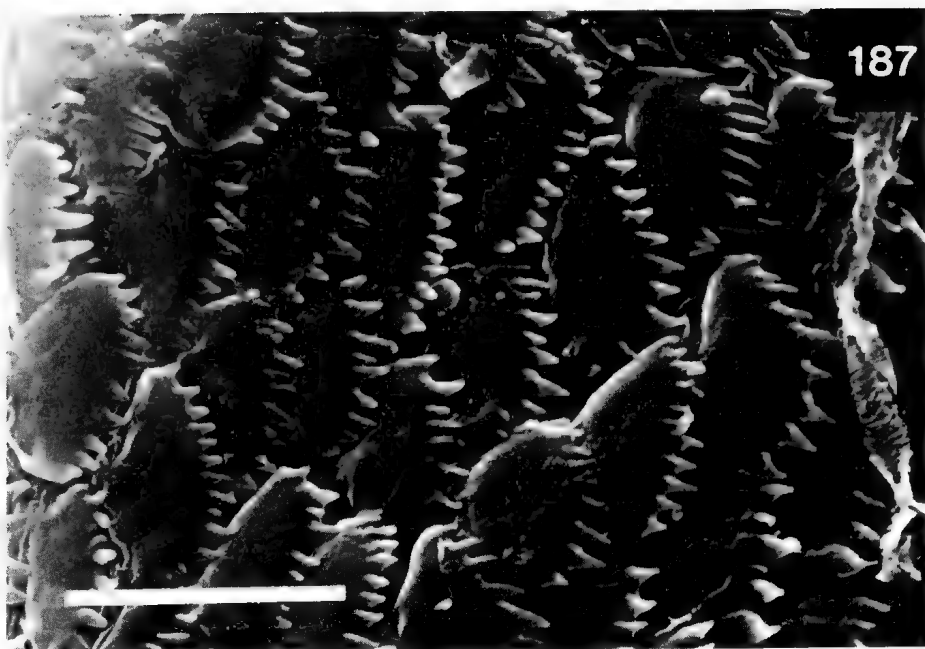
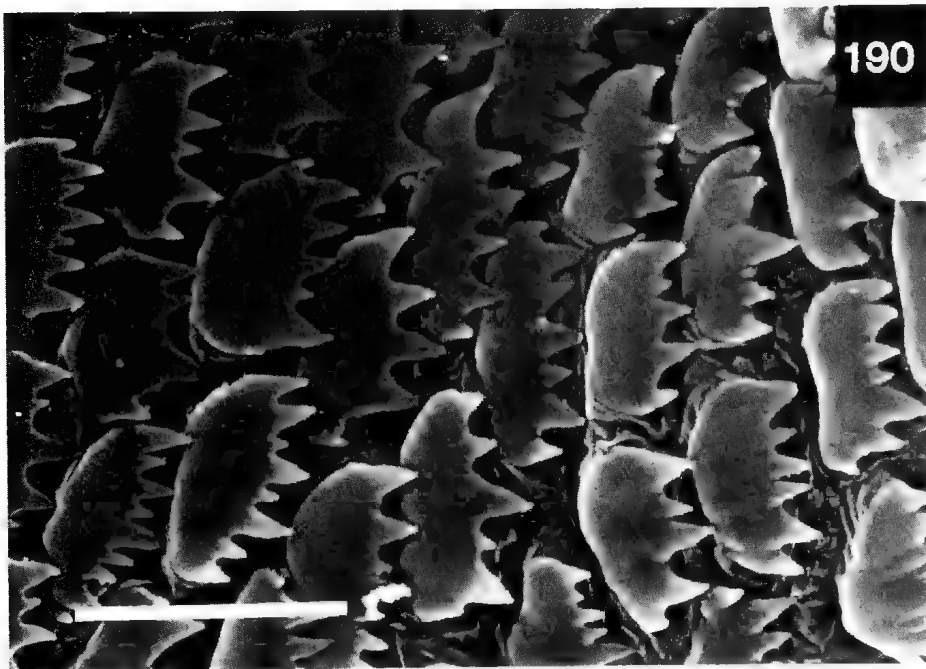
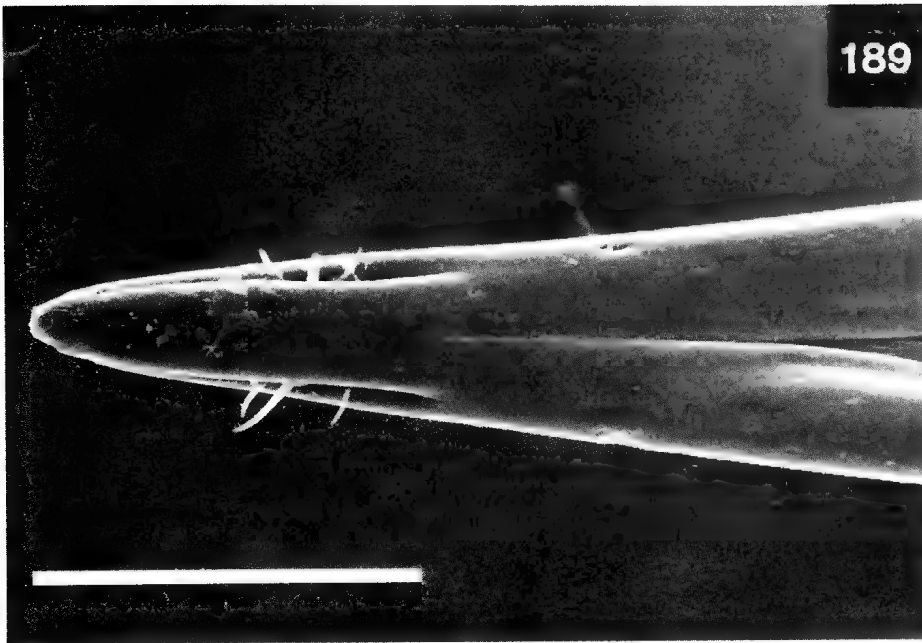
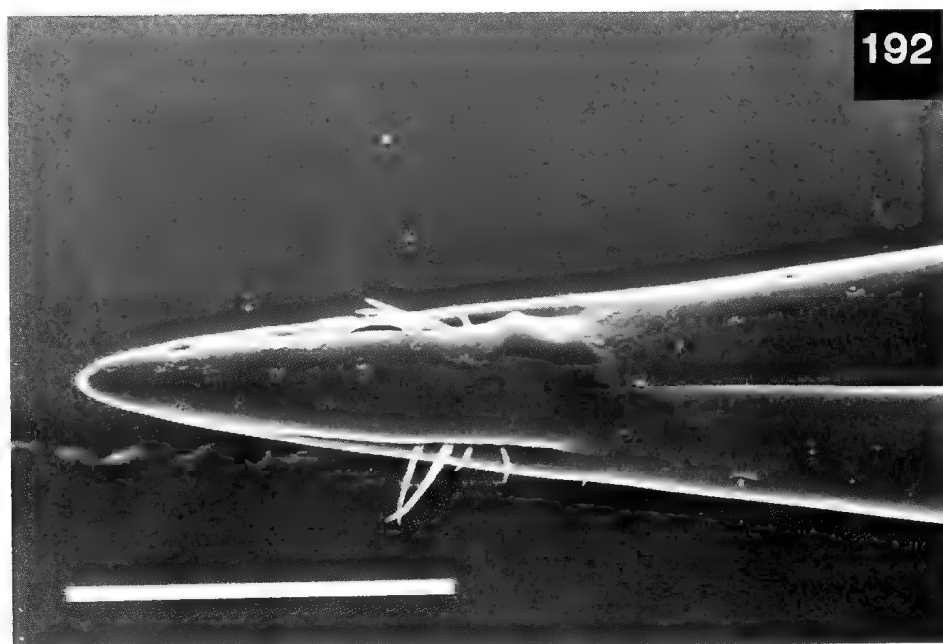
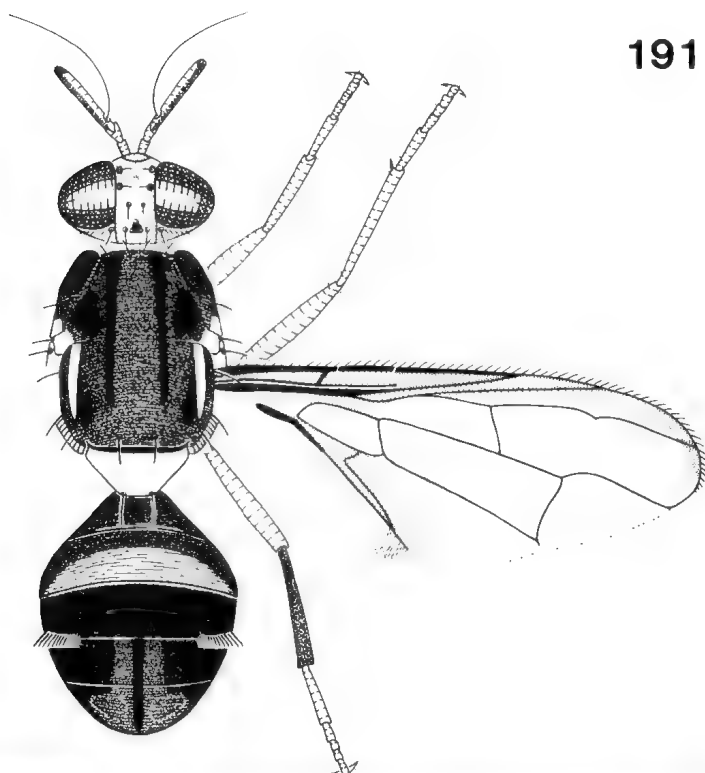


FIG. 187. *Bactrocera* (*Bactrocera*) *aquilonis* (May), spicules on distal end of middle segment of ovipositor (scale 0.01mm). FIG. 188. *Bactrocera* (*Bactrocera*) *melas* (Perkins and May), adult female (x9).



FIGS 189–190. *Bactrocera* (*Bactrocera*) *melas* (Perkins and May): 189, apex of aculeus (scale 0.1 mm); 190, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 191–192. *Bactrocera* (*Bactrocera*) *neohumeralis* (Hardy): 191, adult male (x10); 192, apex of aculeus (scale 0.1 mm).

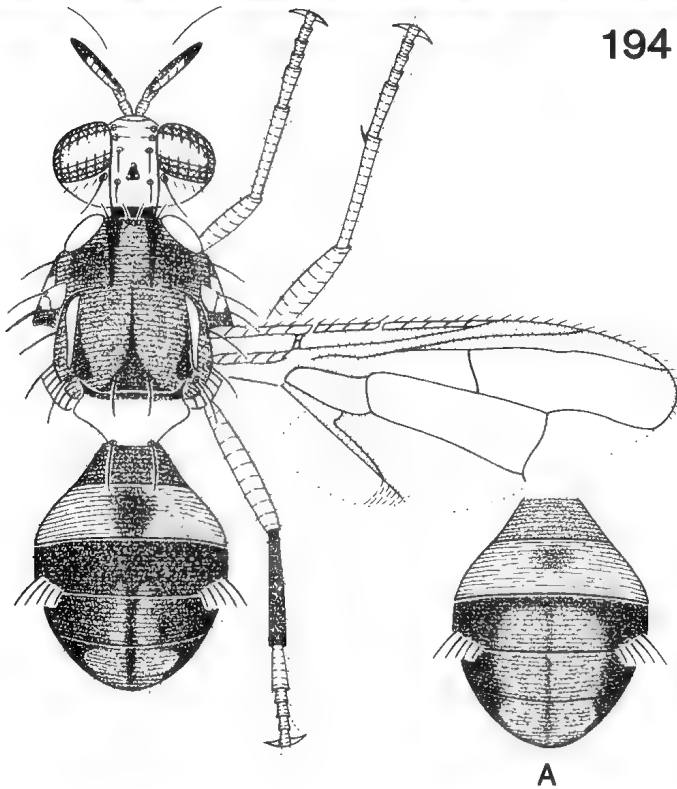
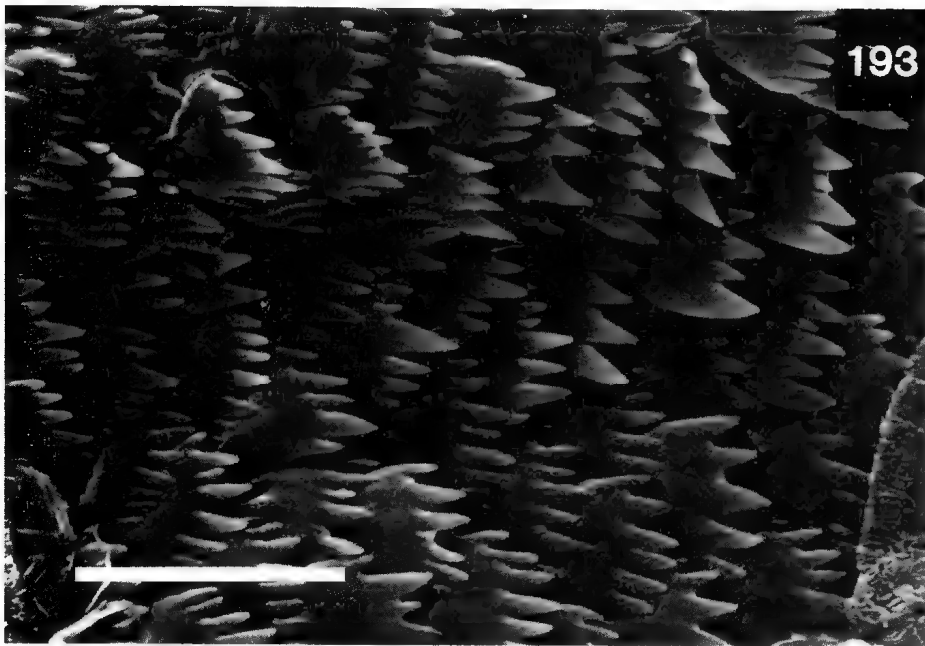
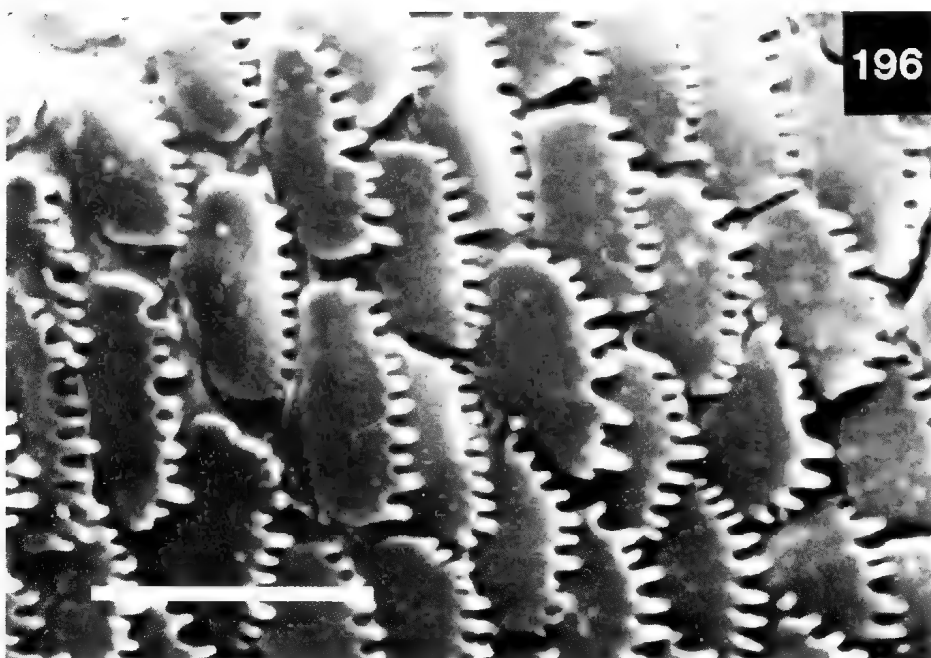
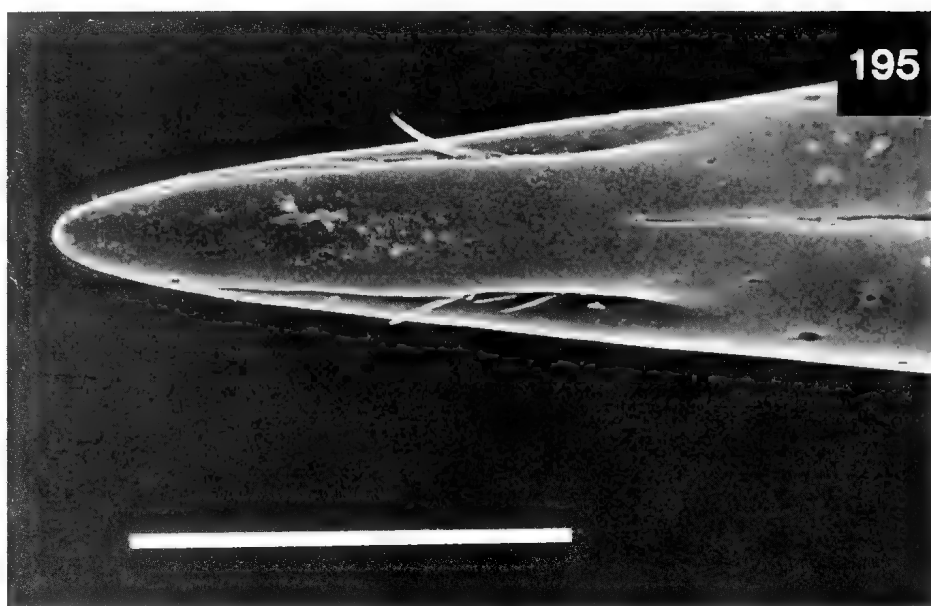
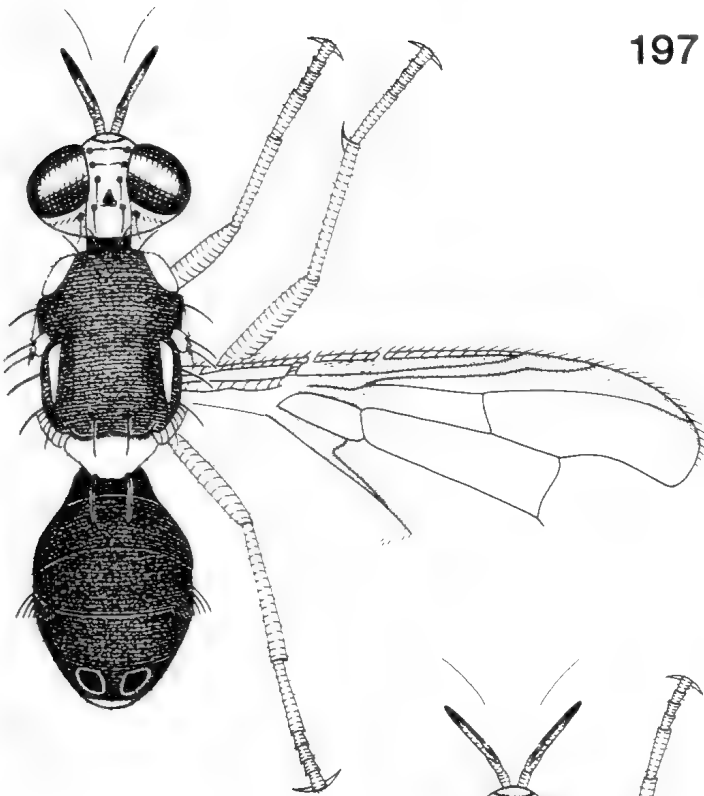


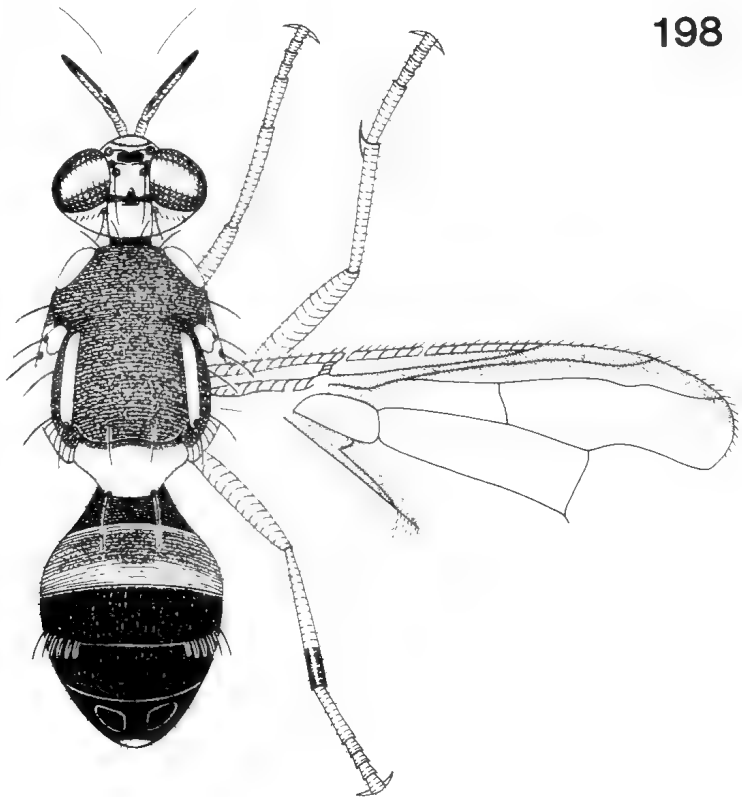
FIG. 193. *Bactrocera* (*Bactrocera*) *neohumeralis* (Hardy), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 194. *Bactrocera* (*Bactrocera*) *tryoni* (Froggatt), adult male (x10). A, pale form of abdomen.



FIGS 195–196. *Bactrocera* (*Bactrocera*) *tryoni* (Froggatt): 195, apex of aculeus (scale 0.1 mm); 196, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

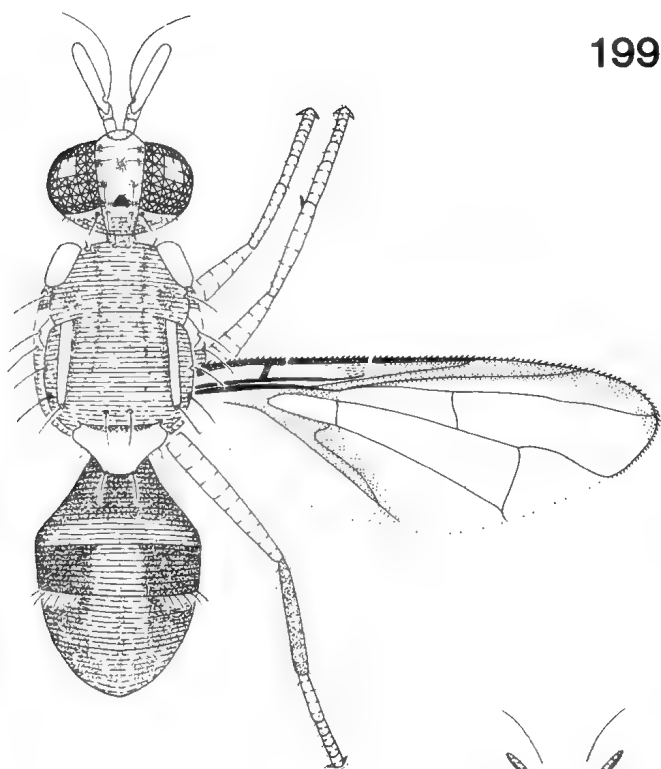


197

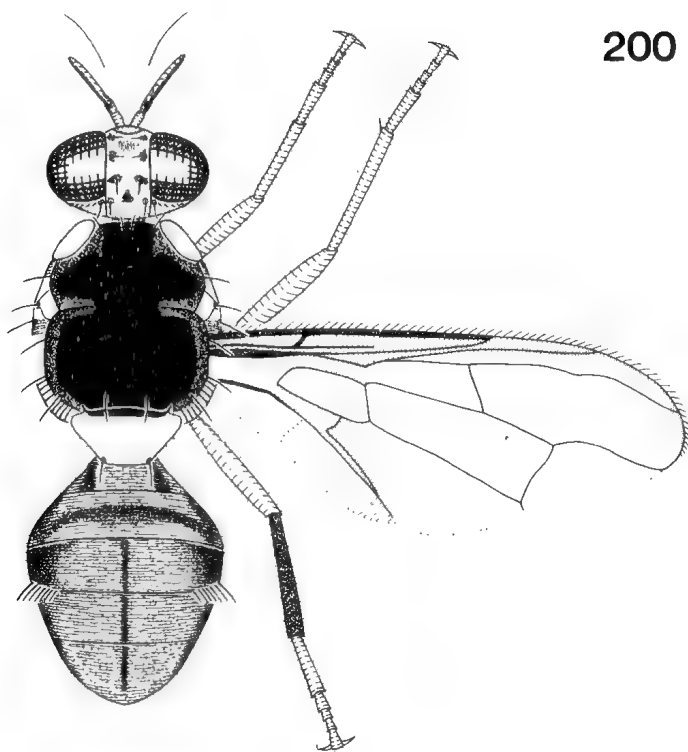


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FIG. 197. *Bactrocera* (*Bactrocera*) *abdofuscata* (Drew), adult male (x11). FIG. 198. *Bactrocera* (*Bactrocera*) *abdonigella* (Drew), adult male (x9).

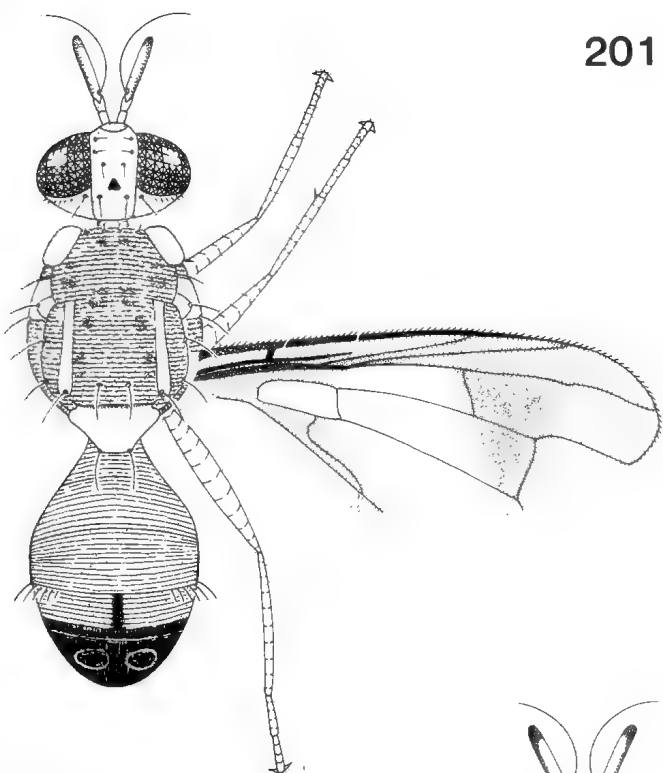


199

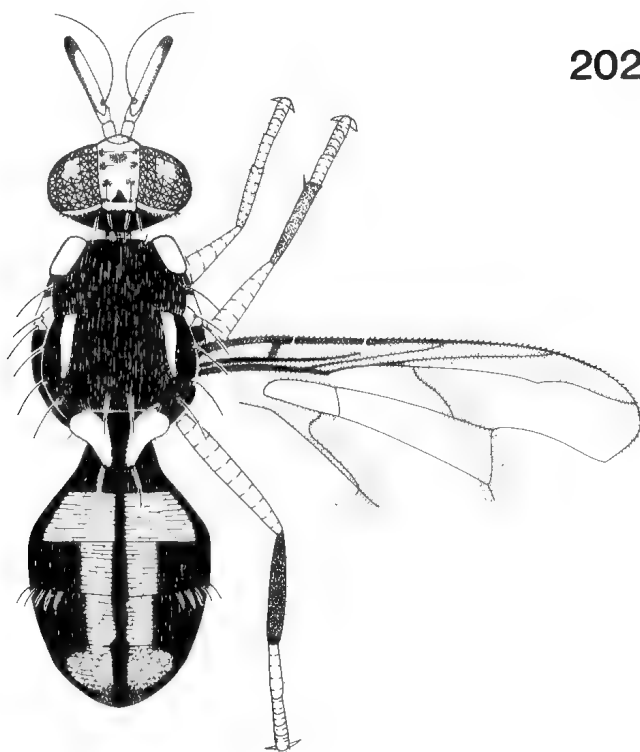


200

FIG. 199. *Bactrocera* (*Bactrocera*) *aithogaster* n. sp., adult male (x11). FIG. 200. *Bactrocera* (*Bactrocera*) *allwoodi* (Drew), adult male (x12).



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FIG. 201. *Bactrocera* (*Bactrocera*) *amplexiseta* (May), adult male (x9). FIG. 202. *Bactrocera* (*Bactrocera*) *angustifasciata* n. sp., adult male (x8).

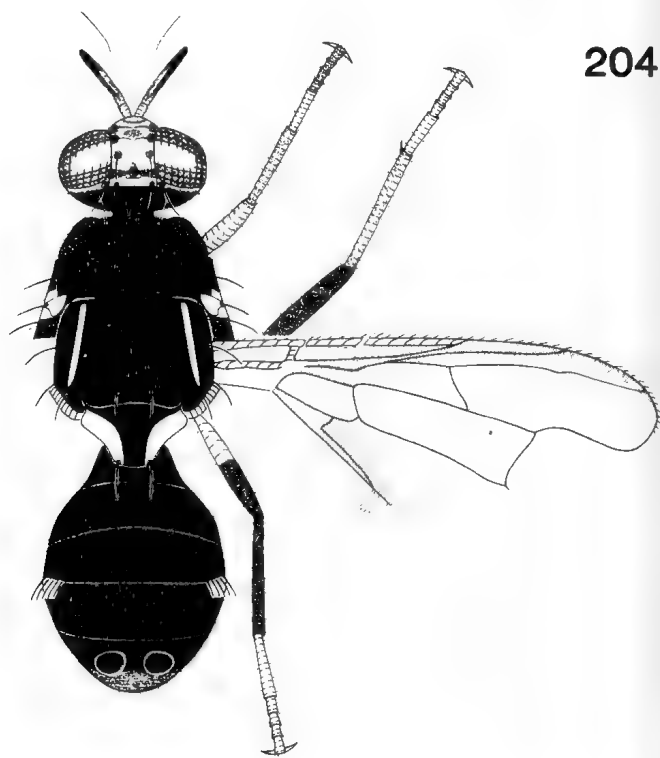
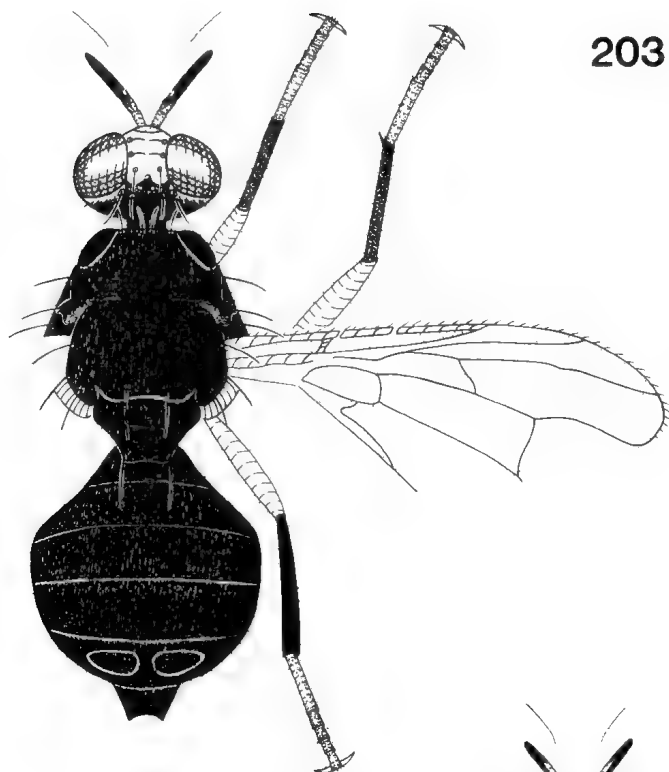
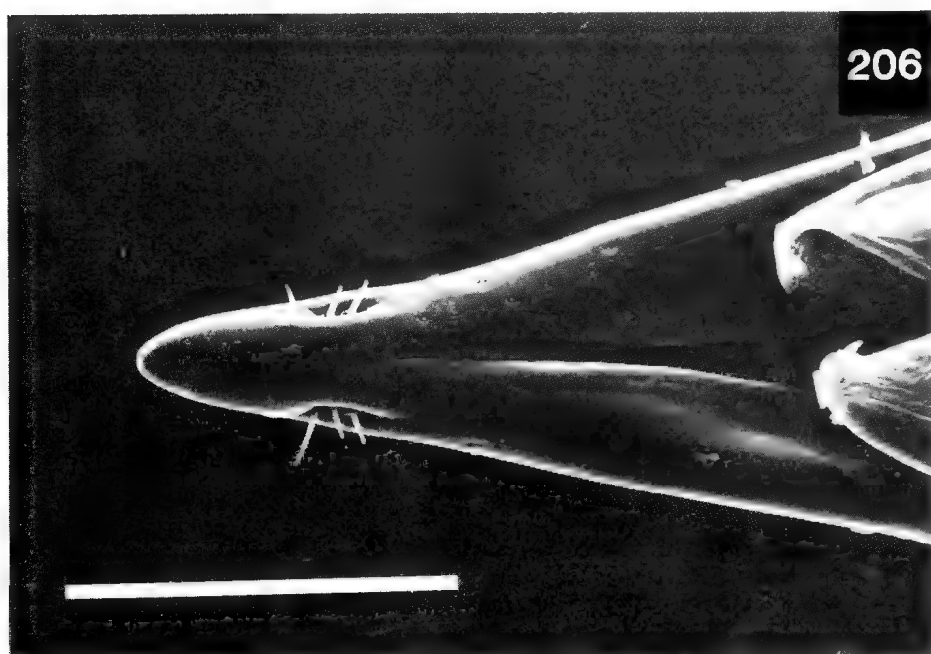
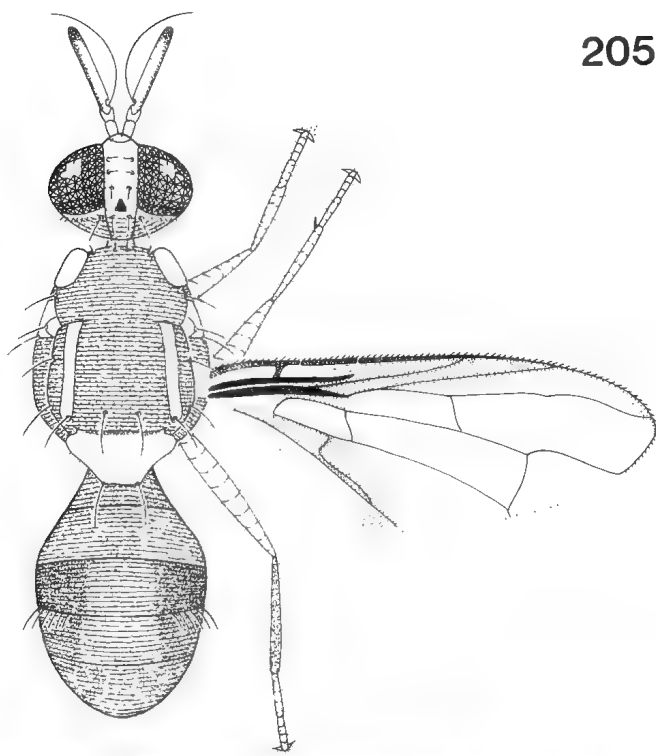


FIG. 203. *Bactrocera* (*Bactrocera*) *atra* (Malloch), adult female (x9). FIG. 204. *Bactrocera* (*Bactrocera*) *atramentata* (Hering), adult male (x8).



FIGS 205–206. *Bactrocera* (*Bactrocera*) *barringtoniae* (Tryon): 205, adult male (x8); 206, apex of aculeus (scale 0.1 mm).

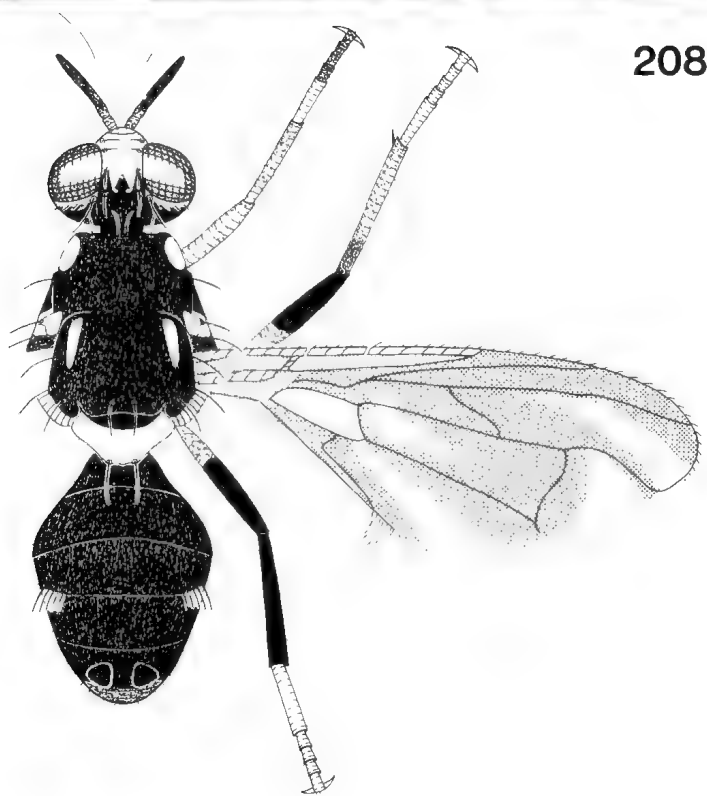
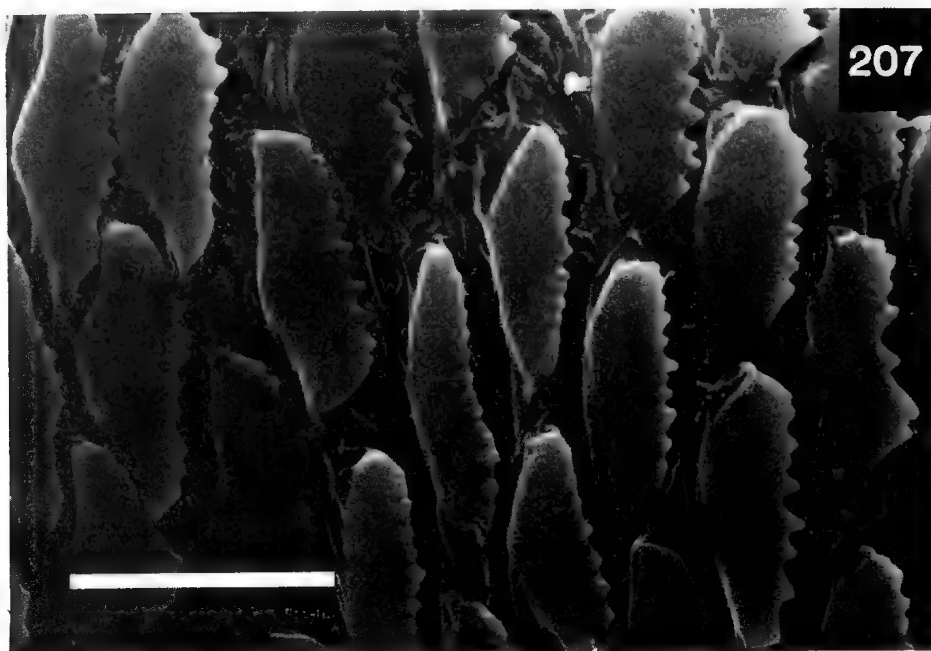
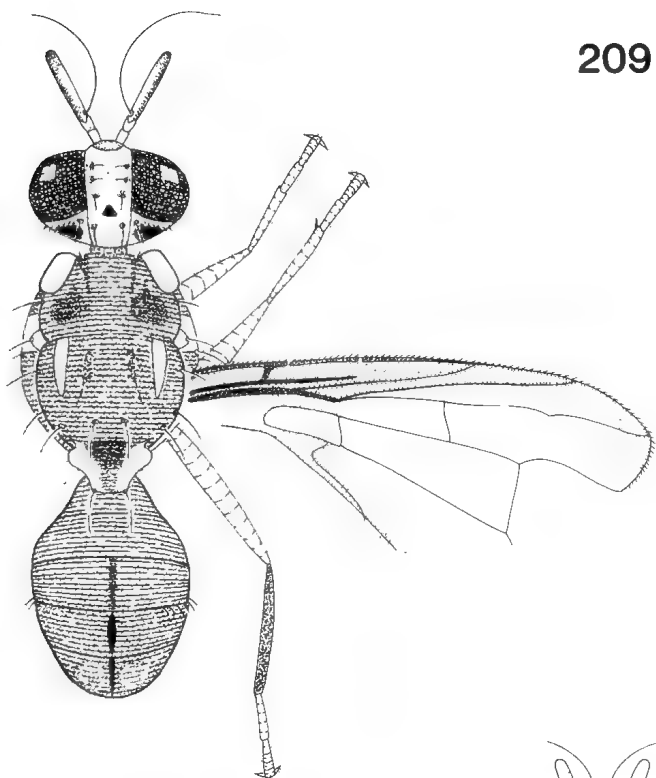


FIG. 207. *Bactrocera* (*Bactrocera*) *barringtoniae* (Tryon), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 208. *Bactrocera* (*Bactrocera*) *biarcuata* (Walker), adult male (x9).

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210

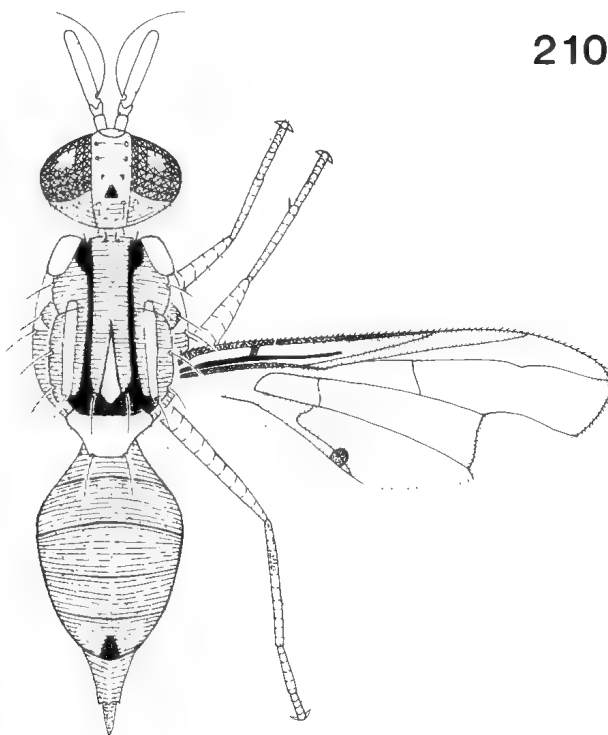
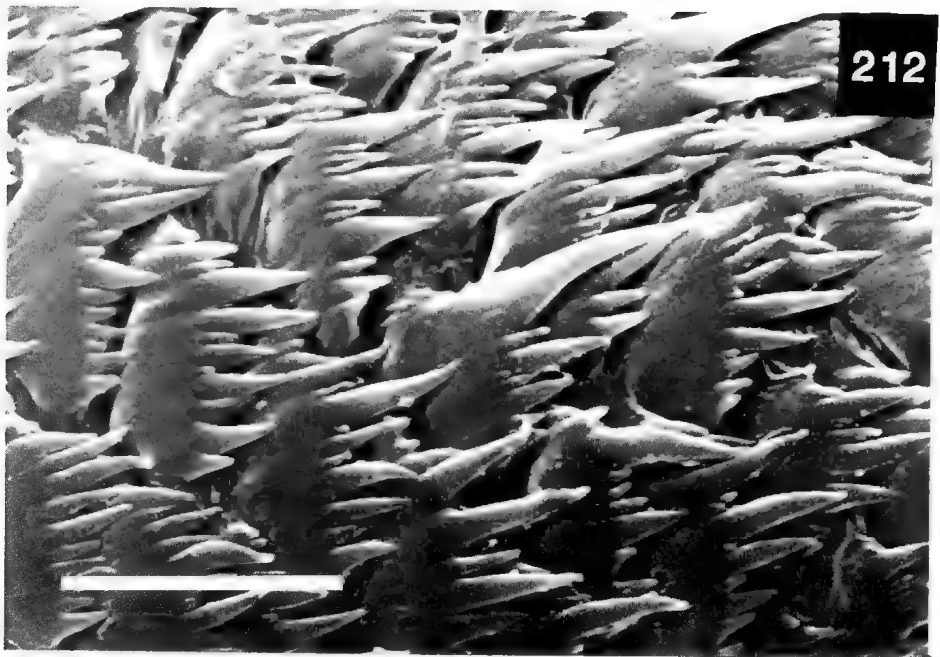
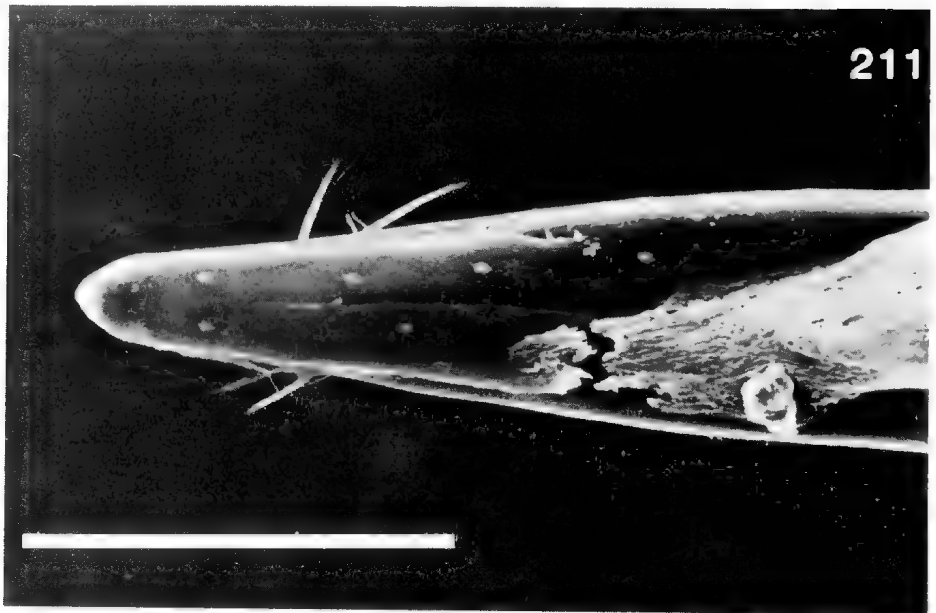
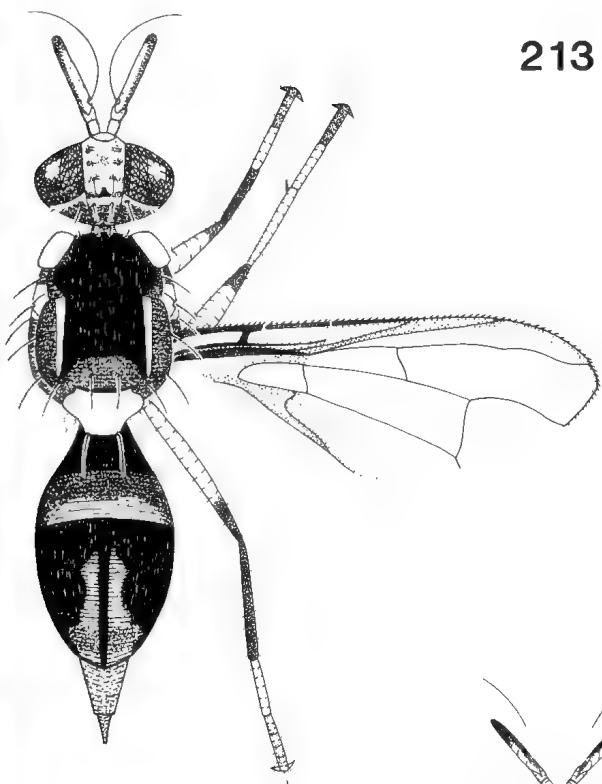


FIG. 209. *Bactrocera (Bactrocera) buinensis* n. sp., adult male (x11). FIG. 210. *Bactrocera (Bactrocera) bullata* n. sp., adult female (x9).



FIGS 211–212. *Bactrocera* (*Bactrocera*) *bullata* n. sp.: 211, apex of aculeus (scale 0.1 mm); 212, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

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214

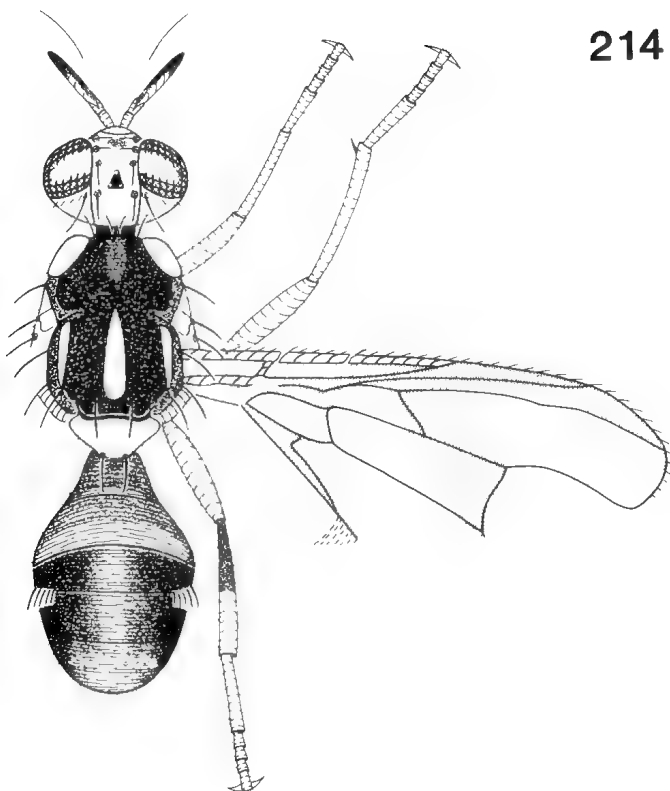
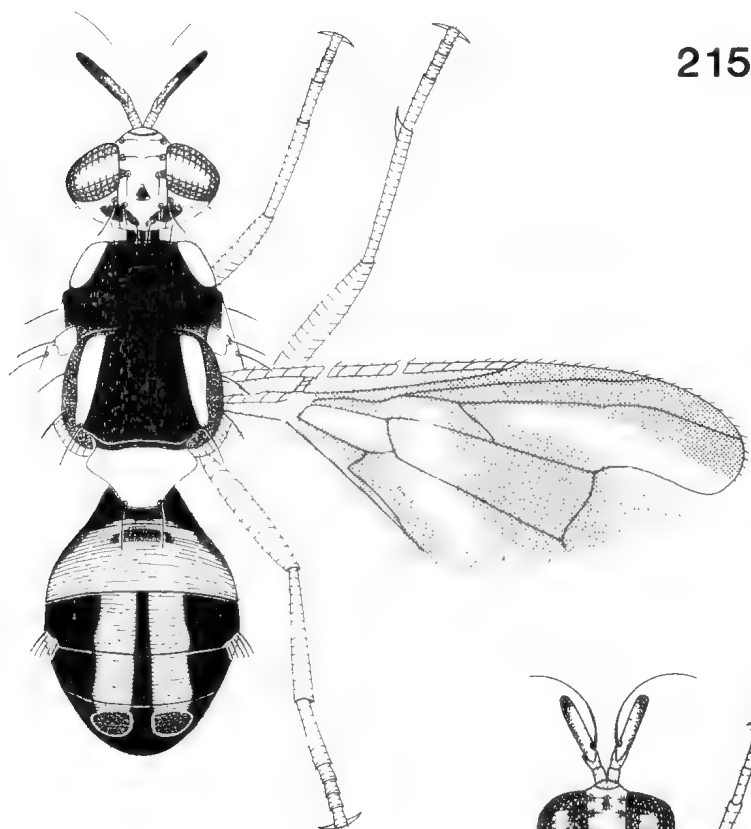
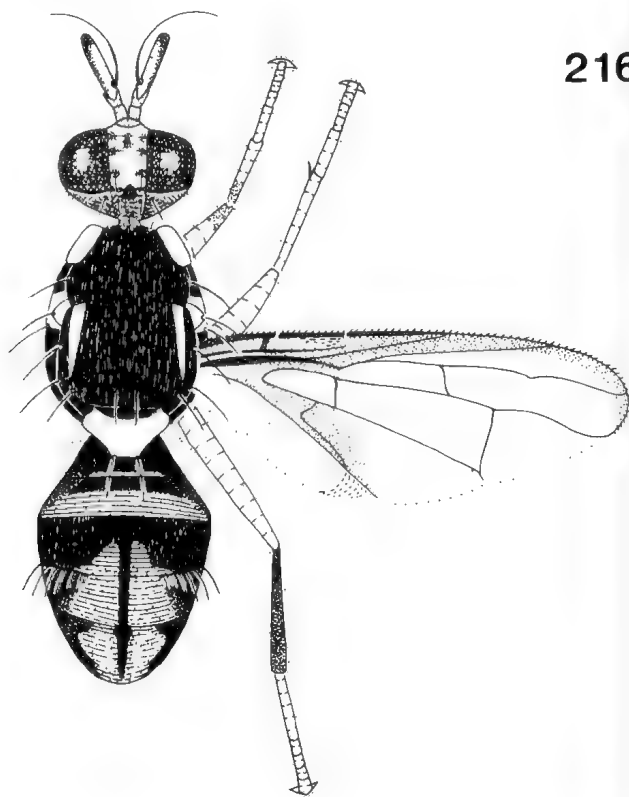


FIG. 213. *Bactrocera* (*Bactrocera*) *buloloensis* n. sp., adult female (x11). FIG. 214. *Bactrocera* (*Bactrocera*) *cheesmanae* (Perkins), adult male (x10).

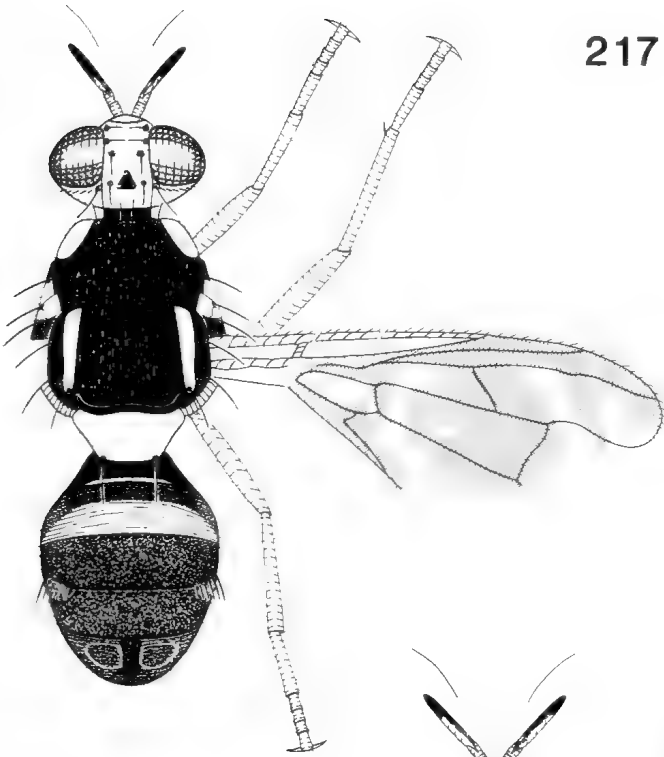


215

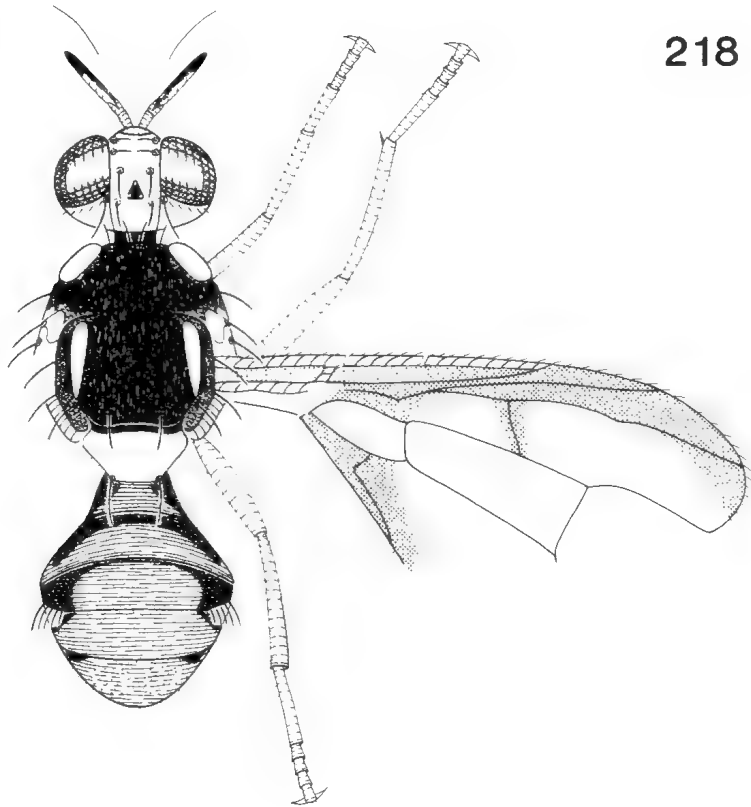


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FIG. 215. *Bactrocera* (*Bactrocera*) *confluens* (Drew), adult male (x8). FIG. 216. *Bactrocera* (*Bactrocera*) *congener* n. sp., adult male (x9).

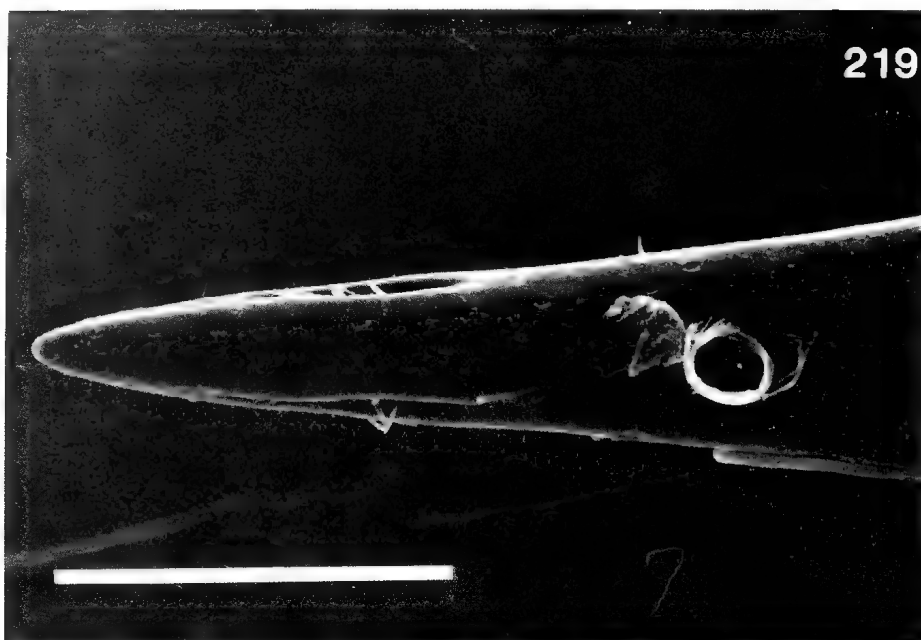


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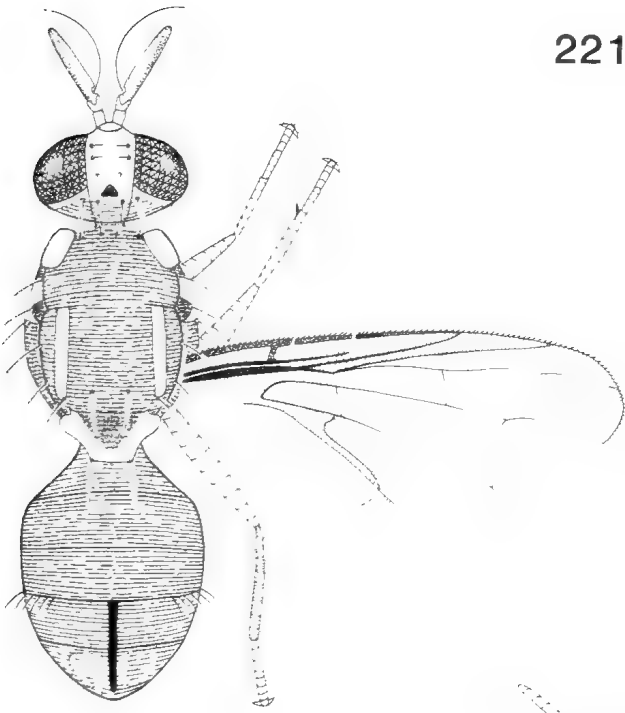


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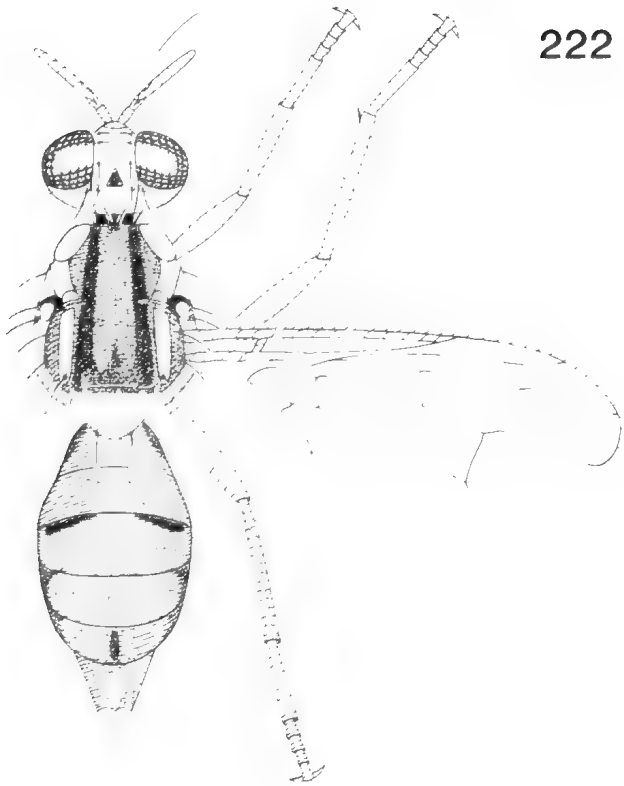
FIG. 217. *Bactrocera* (*Bactrocera*) *curvifera* (Walker), adult male (x6). FIG. 218. *Bactrocera* (*Bactrocera*) *curvipennis* (Froggatt), adult male (x13).



FIGS 219–220. *Bactrocera* (*Bactrocera*) *curvipennis* (Froggatt): 219, apex of aculeus (scale 0.1 mm); 220, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

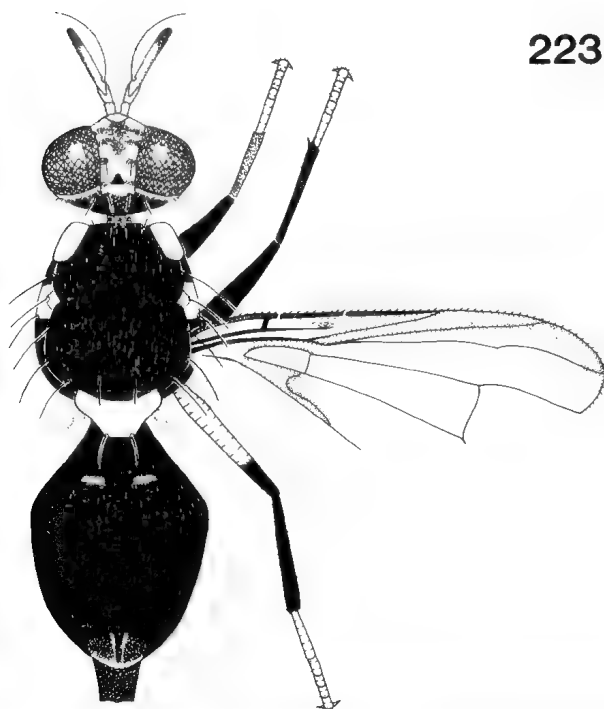


221

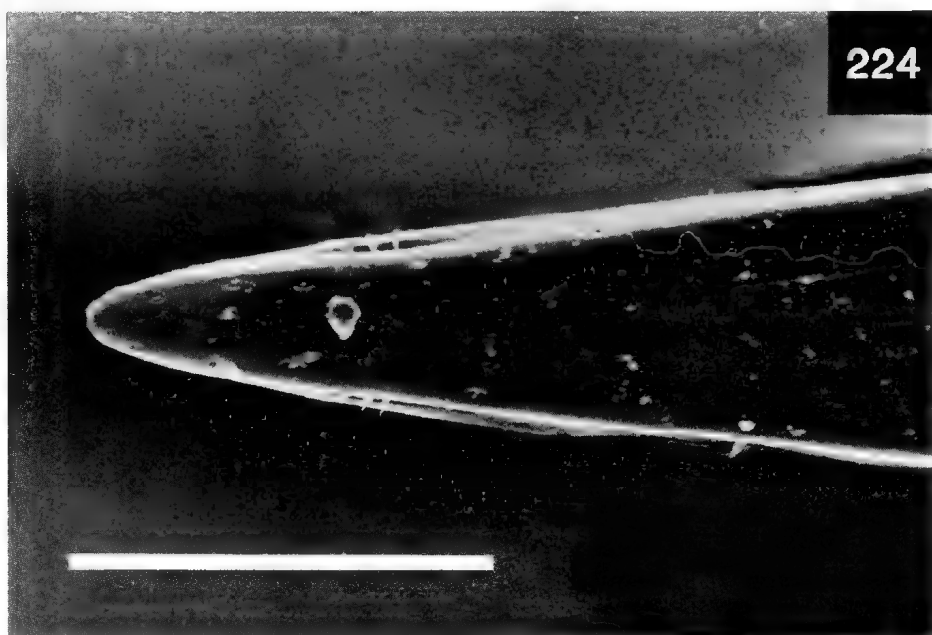


222

FIG. 221. *Bactrocera* (*Bactrocera*) *daruensis* n. sp., adult male (x10). FIG. 222. *Bactrocera* (*Bactrocera*) *diaphana* (Hering), adult female (x10).



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224

FIGS 223–224. *Bactrocera* (*Bactrocera*) *diospyri* n. sp.: 223, adult female (x11); 224, apex of aculeus (scale 0.1 mm).

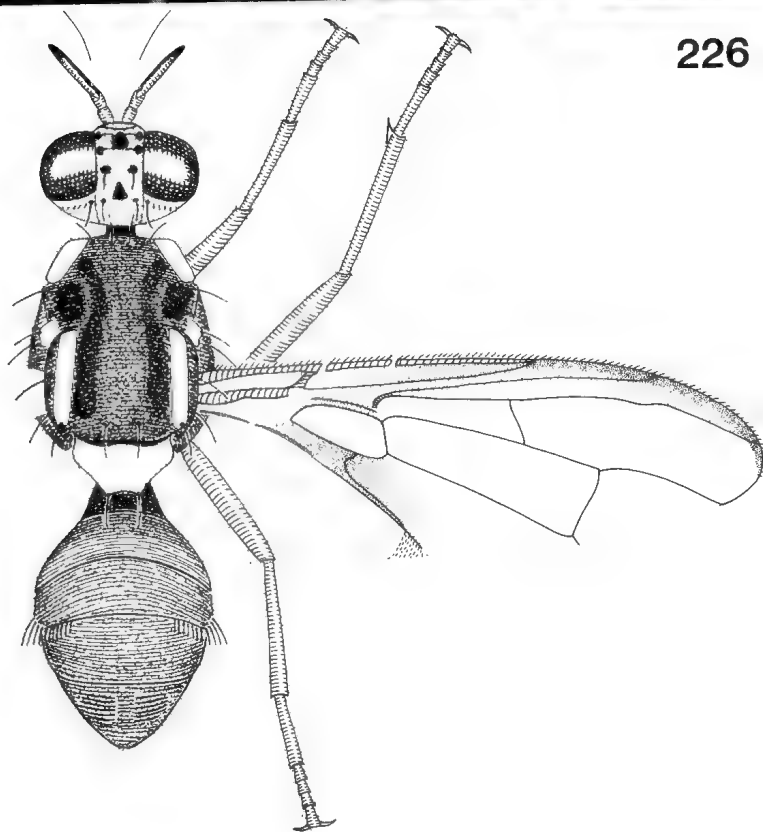
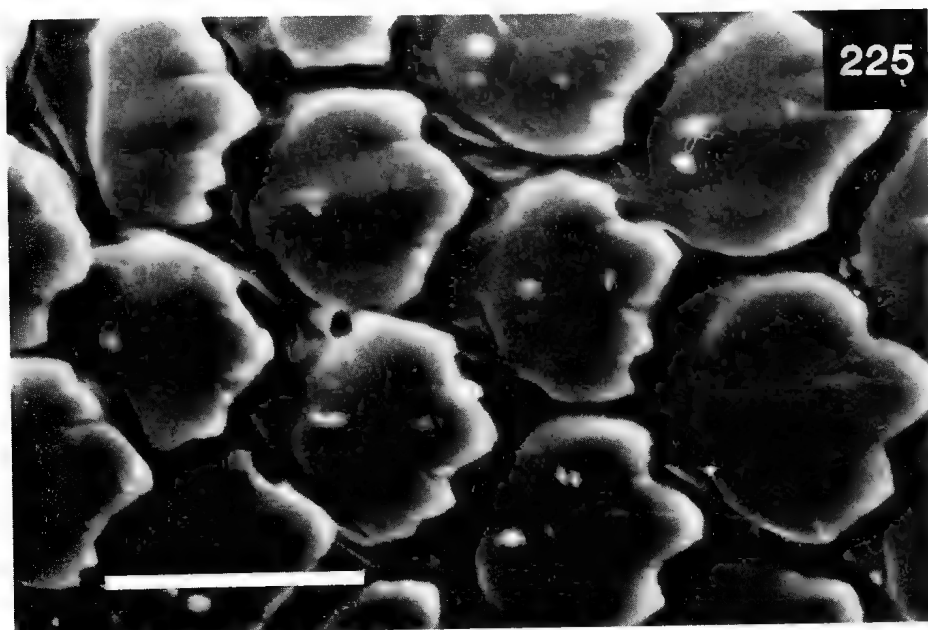
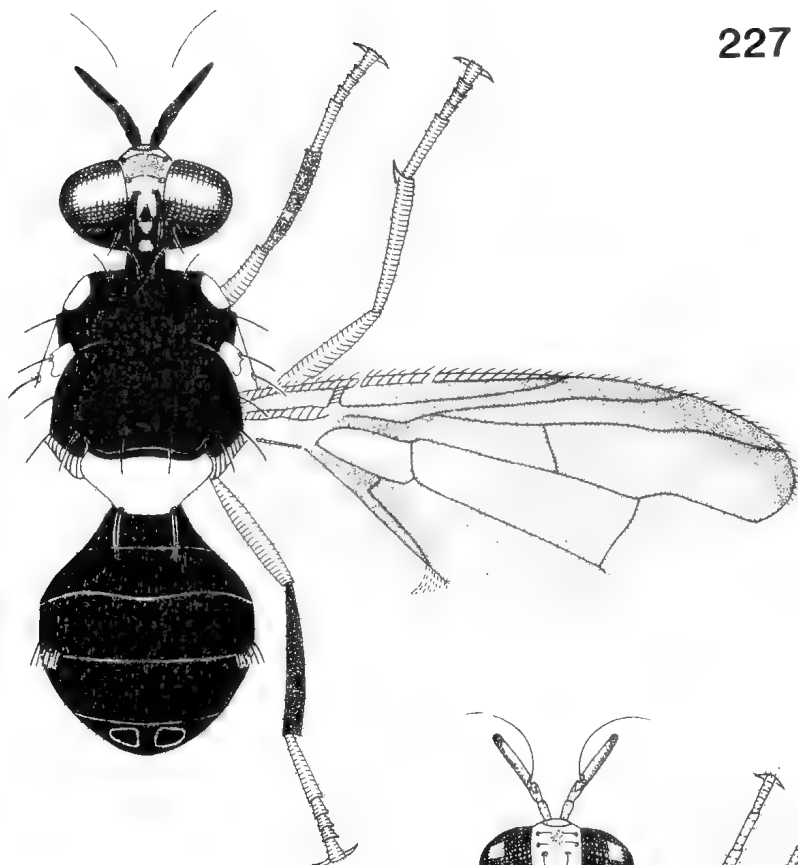
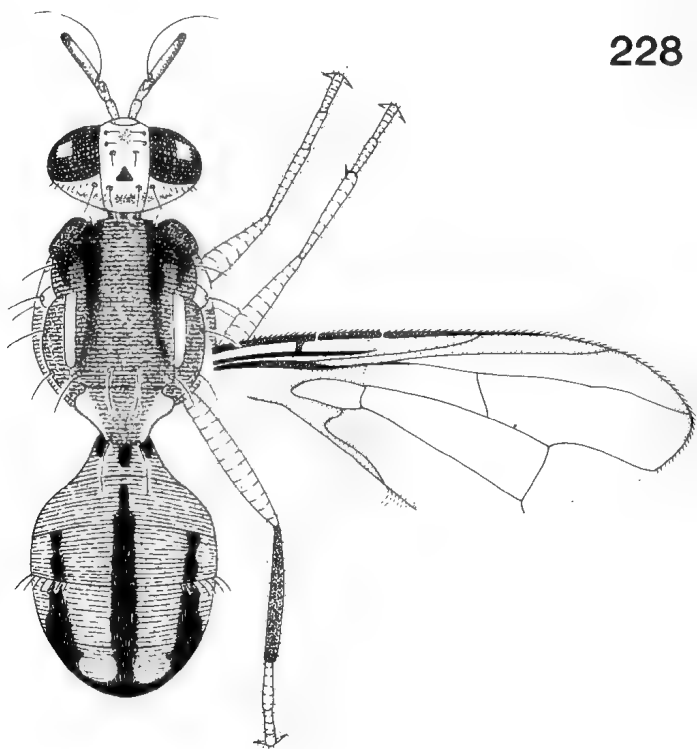


FIG. 225. *Bactrocera* (*Bactrocera*) *diospyri* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 226. *Bactrocera* (*Bactrocera*) *dyscrita* (Drew), adult male (x10).



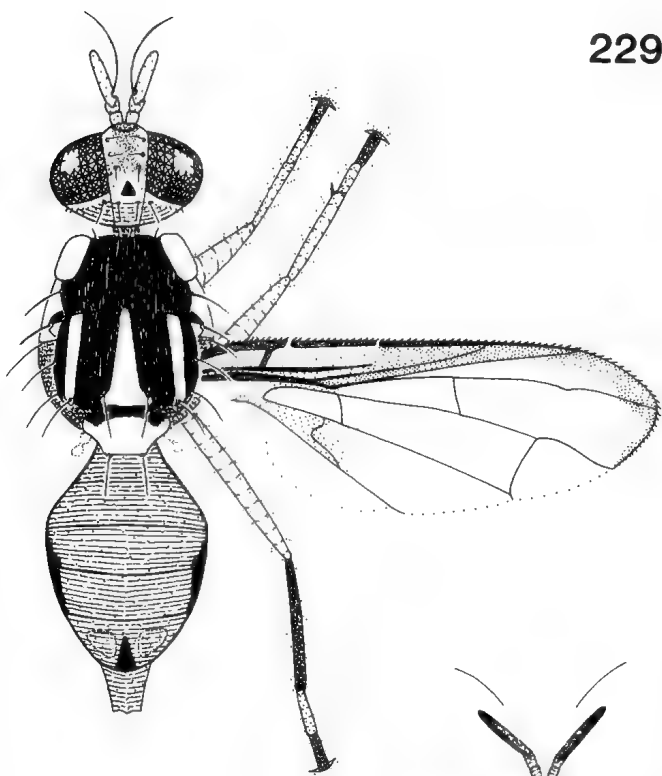
227



228

FIG. 227. *Bactrocera* (*Bactrocera*) *ebenea* (Drew), adult male (x10). FIG. 228. *Bactrocera* (*Bactrocera*) *enochra* (Drew), adult male (x9).

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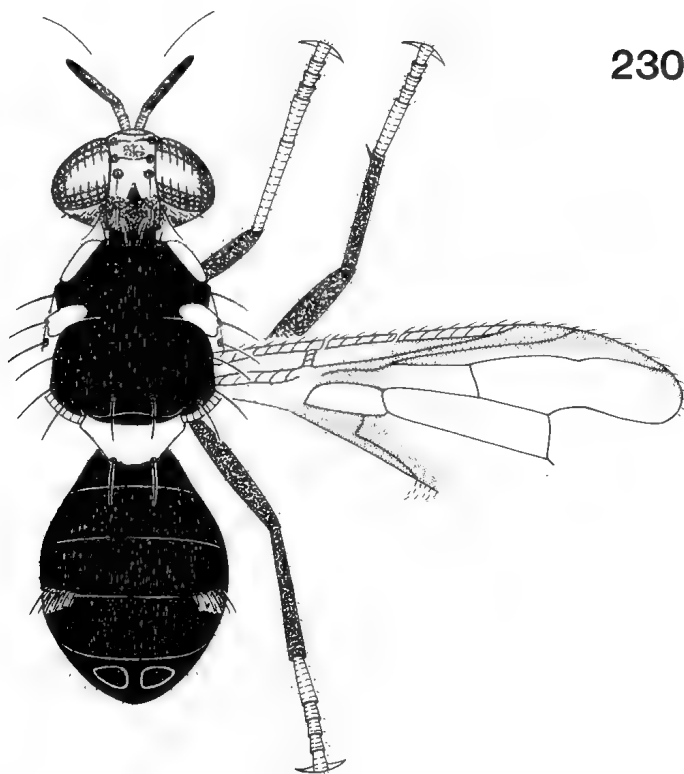
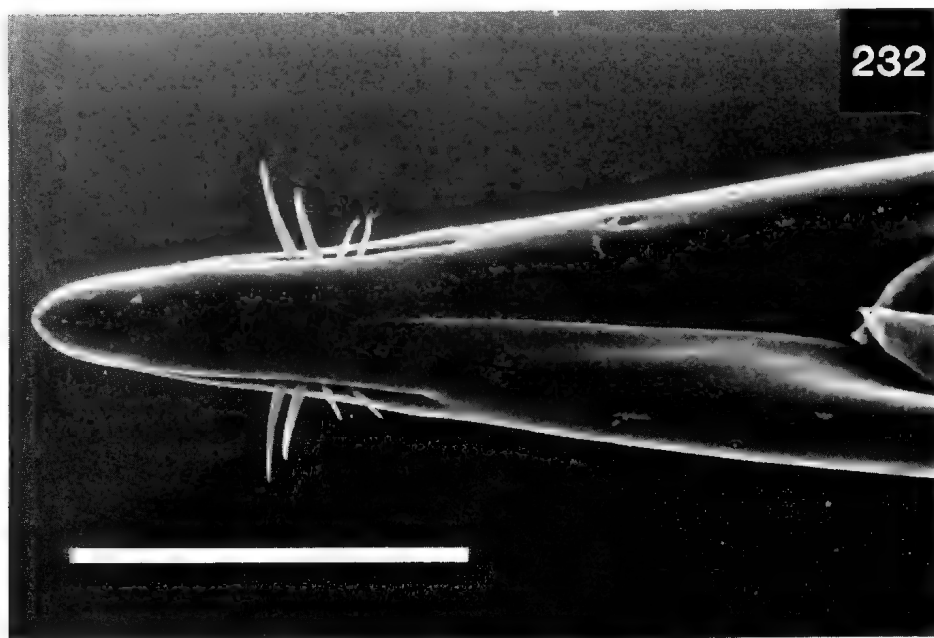
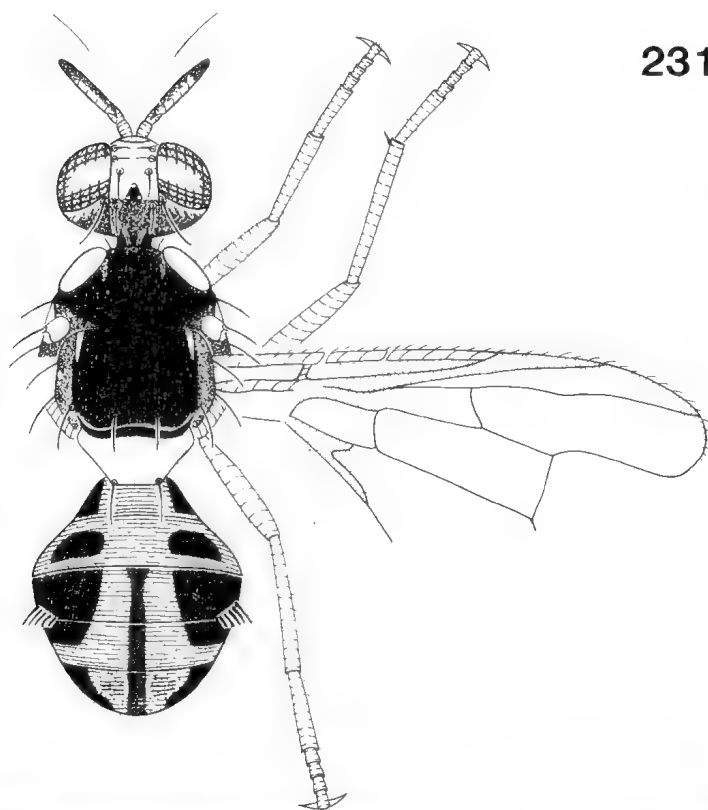


FIG. 229. *Bactrocera (Bactrocera) eximia* n. sp., adult female (x12). FIG. 230. *Bactrocera (Bactrocera) exspoliata* (Hering), adult male (x11).



FIGS 231–232. *Bactrocera* (*Bactrocera*) *facialis* (Coquillett): 231, adult male (x14); 232, apex of aculeus (scale 0.1 mm).

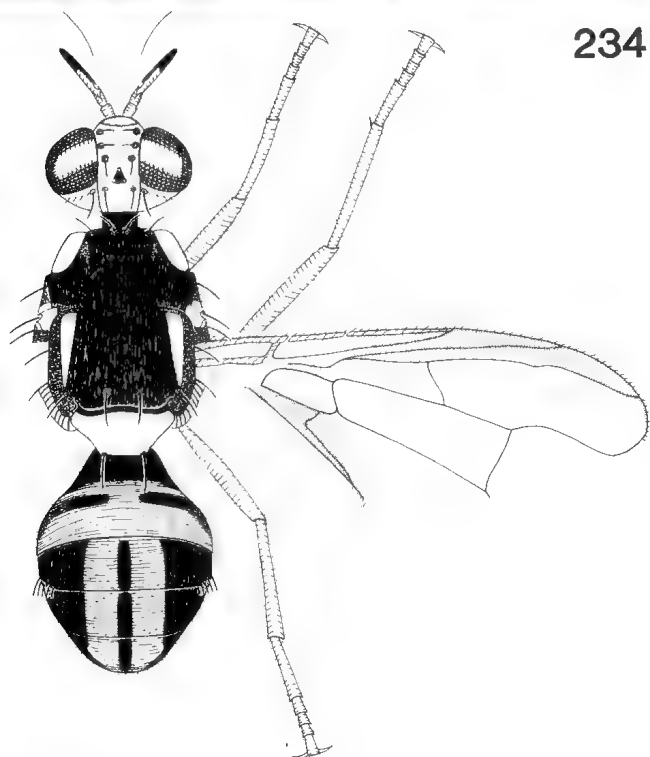
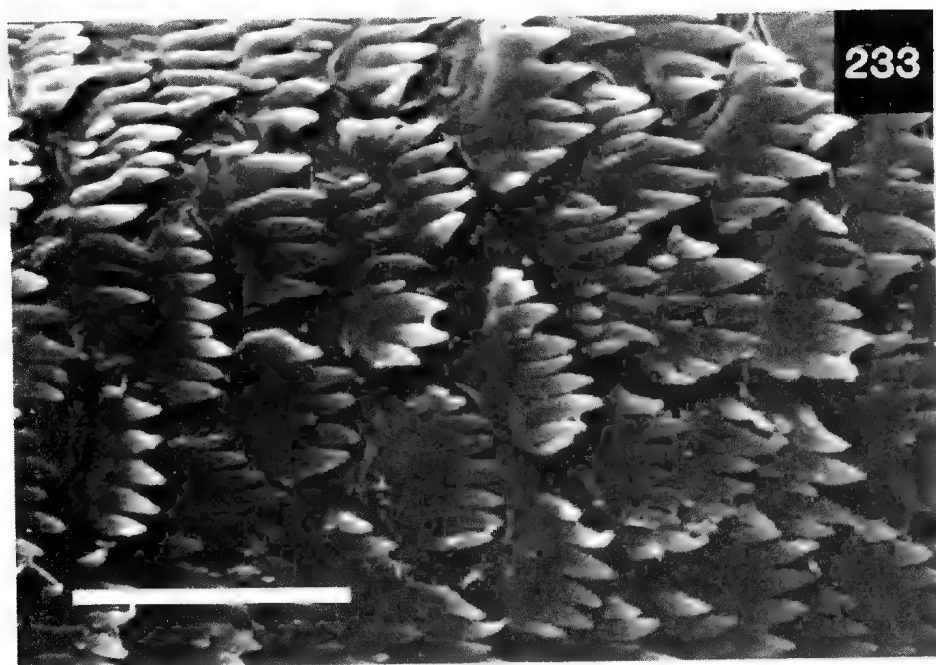


FIG 233. *Bactrocera* (*Bactrocera*) *facialis* (Coquillett), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 234. *Bactrocera* (*Bactrocera*) *froggatti* (Bezzi), adult male (x9).

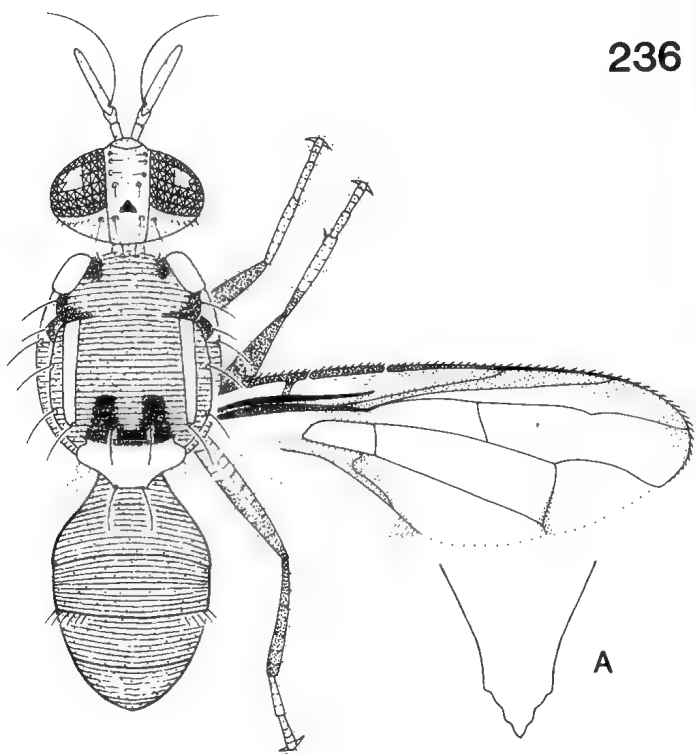
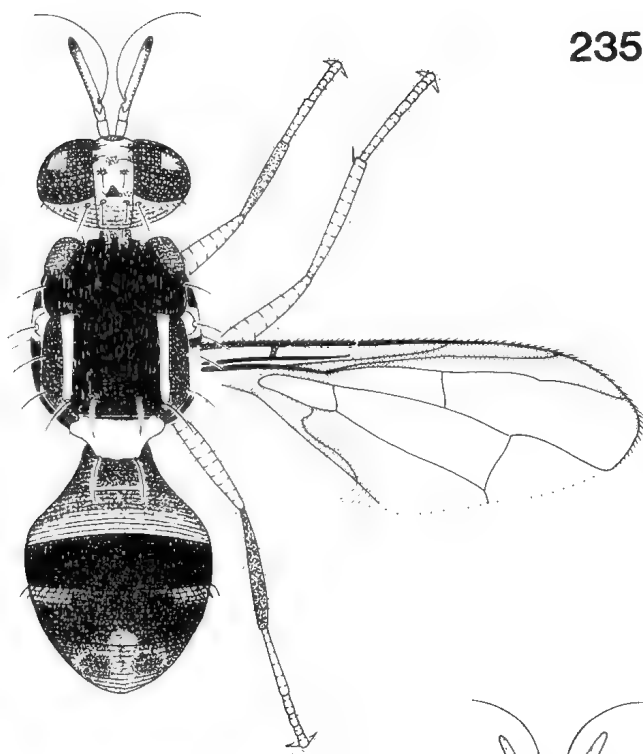


FIG. 235. *Bactrocera* (*Bactrocera*) *furvescens* n. sp., adult male (x10). FIG. 236. *Bactrocera* (*Bactrocera*) *hispidula* (May), adult male (x12). A, apex of aculeus.

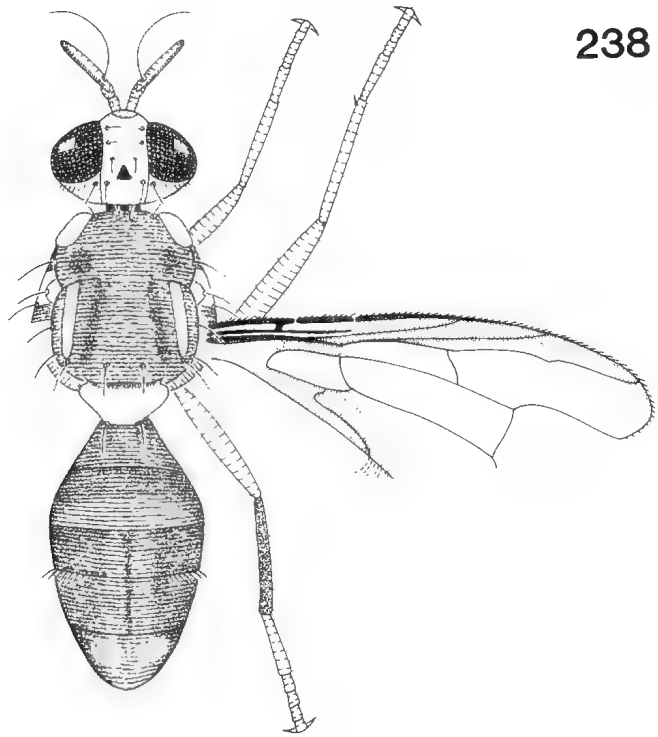
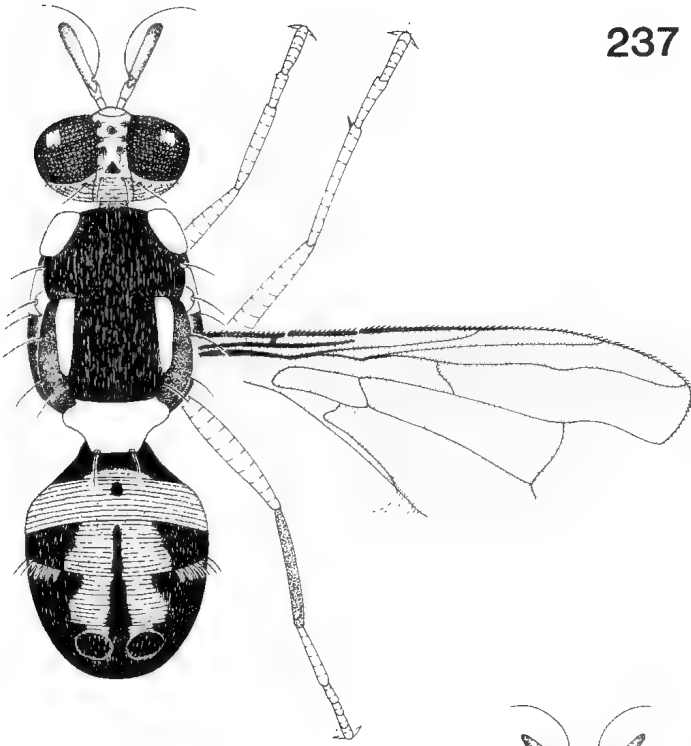
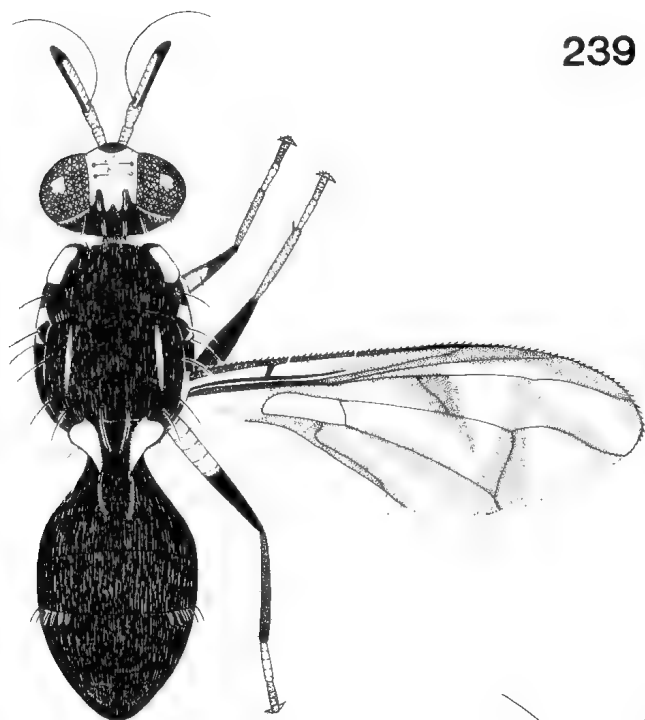
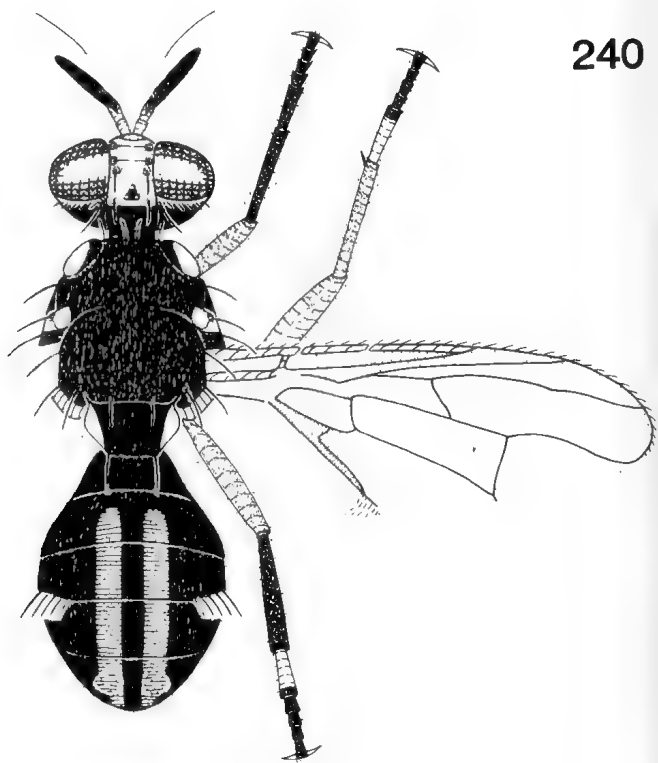


FIG. 237. *Bactrocera* (*Bactrocera*) *honiarae* n. sp., adult male (x7). FIG. 238. *Bactrocera* (*Bactrocera*) *humilis* (Drew and Hancock), adult male (x16).

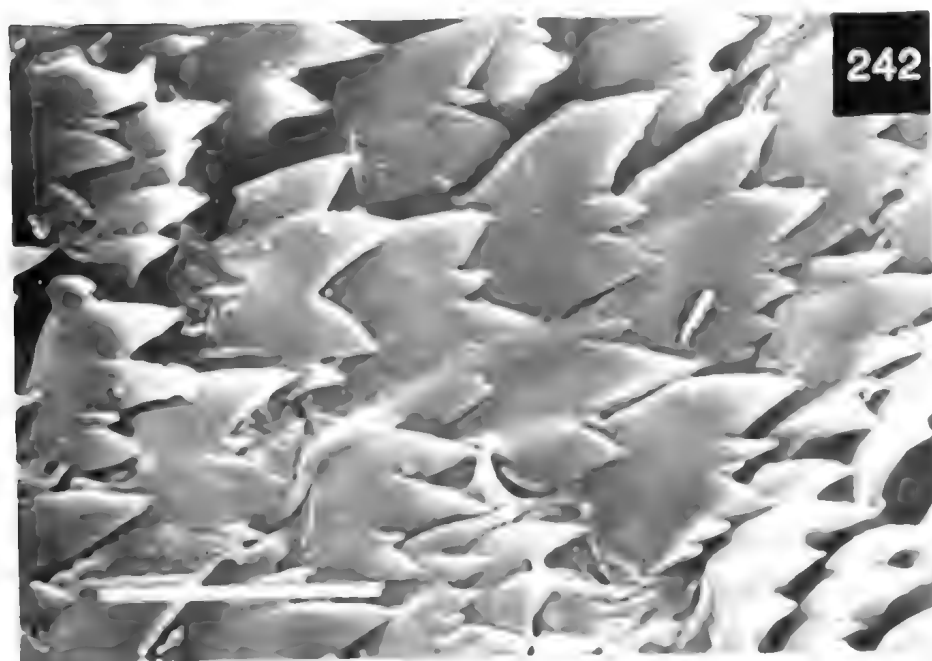
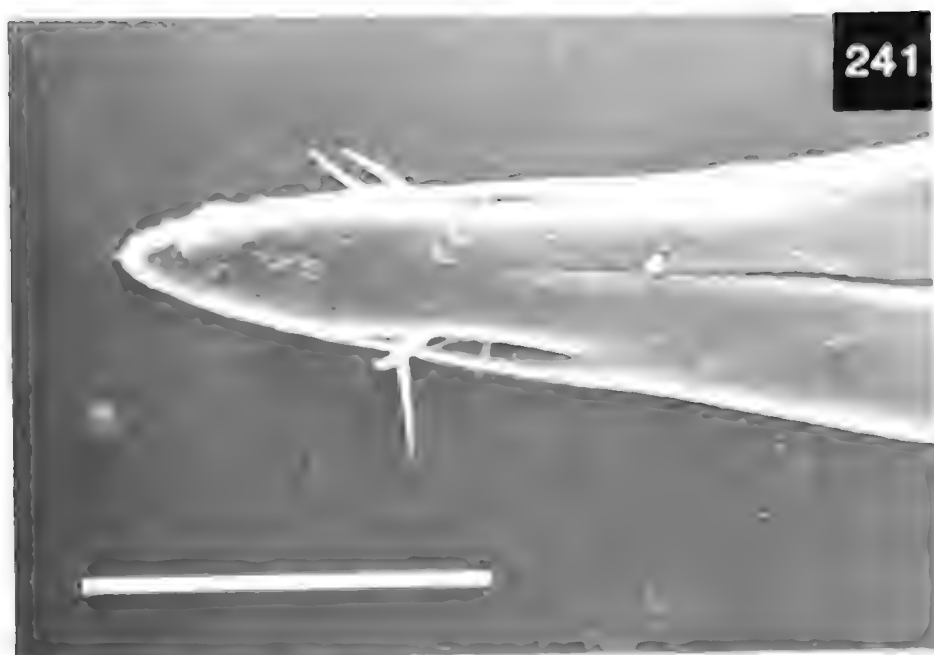


239

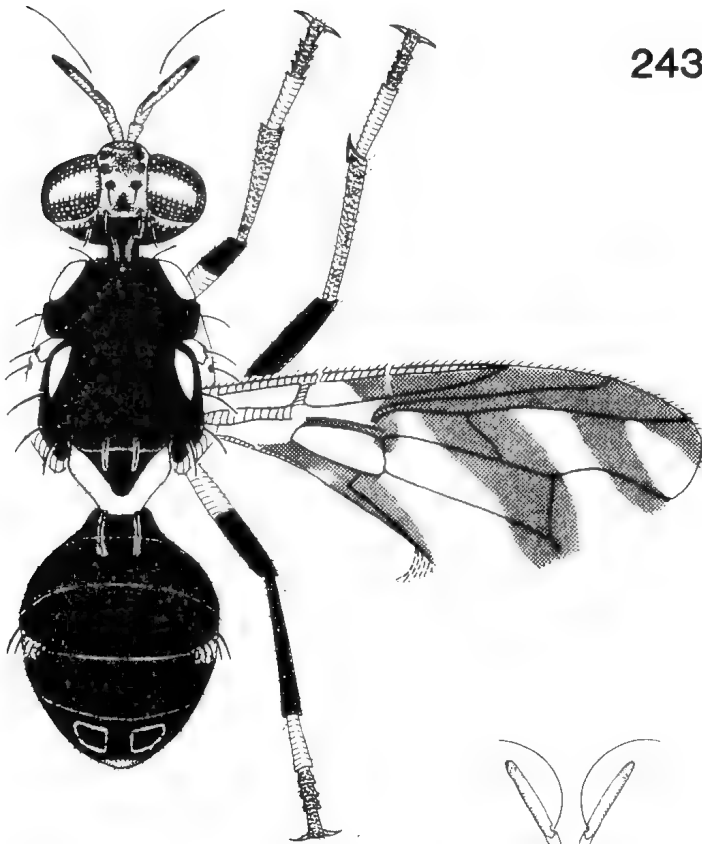


240

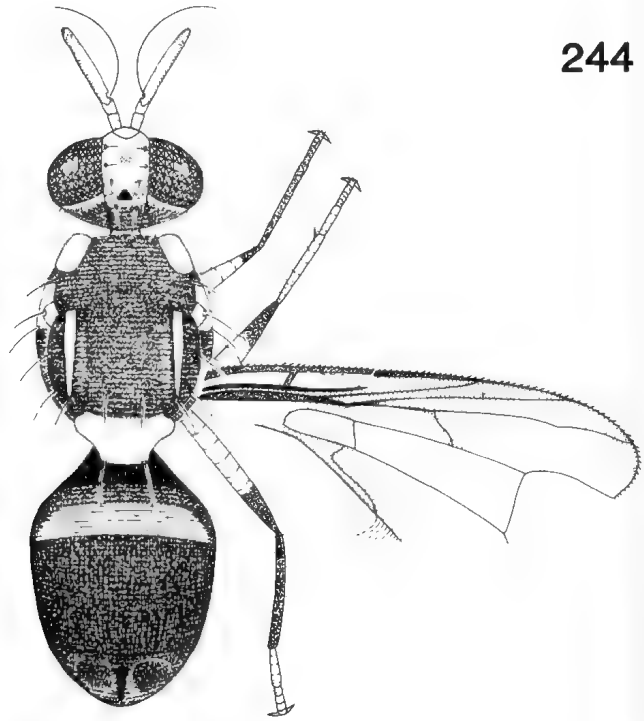
FIG. 239. *Bactrocera* (*Bactrocera*) *ismayi* n. sp., adult male (x9). FIG. 240. *Bactrocera* (*Bactrocera*) *kirki* (Froggatt), adult male (x9).



FIGS 241–242. *Bactrocera (Bactrocera) kirki* (Froggatt): 241, apex of aculeus (scale 0.1 mm); 242, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

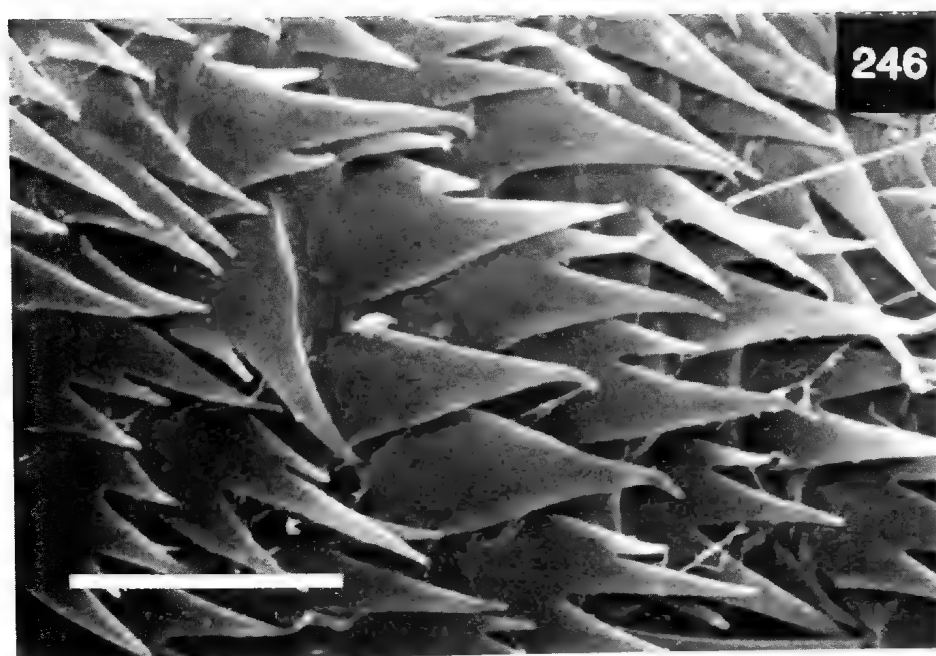
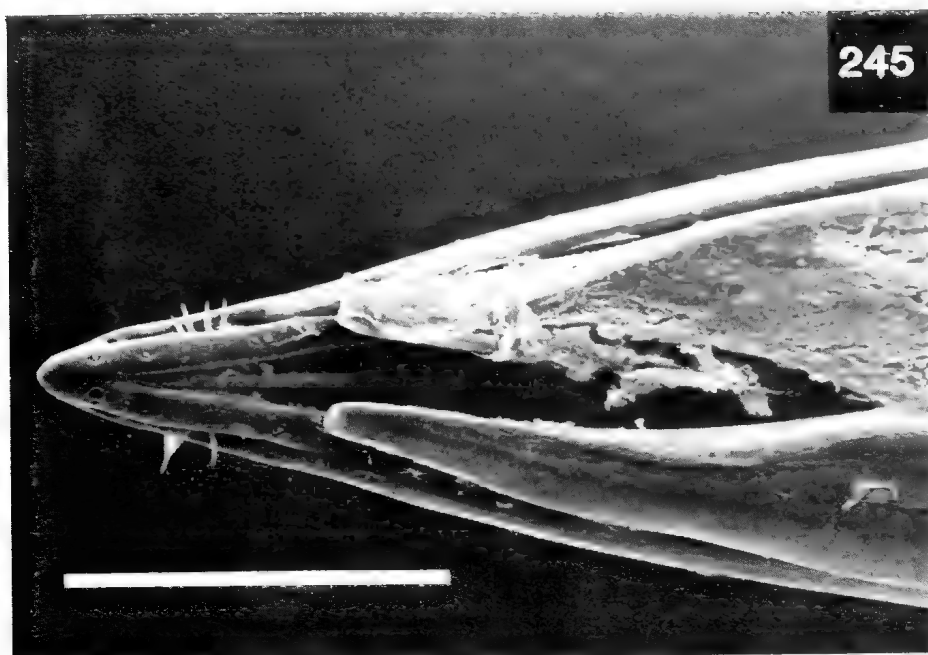


243

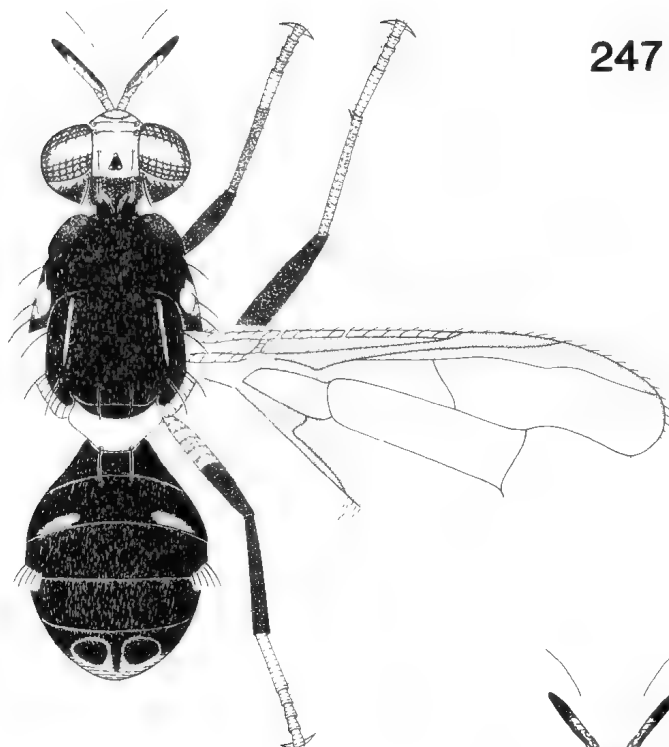


244

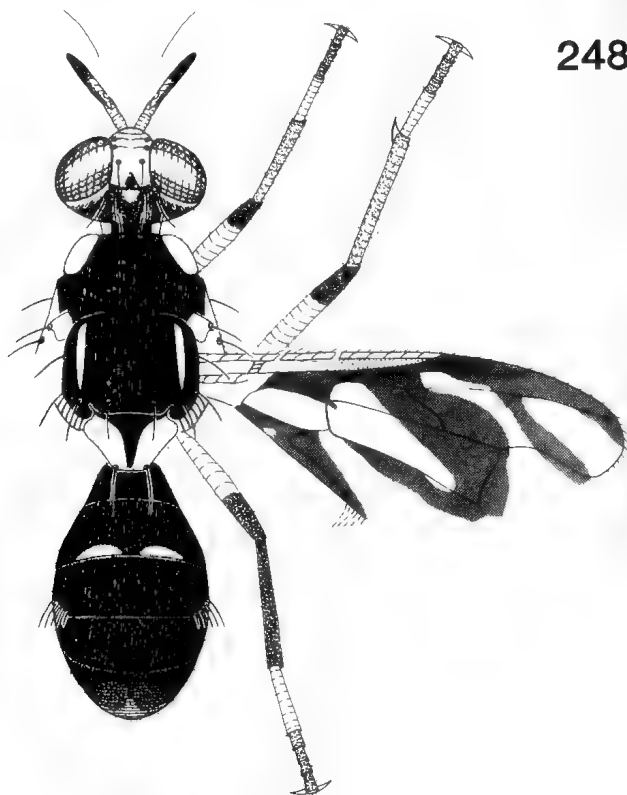
FIG. 243. *Bactrocera* (*Bactrocera*) *lampabilis* (Drew), adult male (x13). FIG. 244. *Bactrocera* (*Bactrocera*) *laticaudus* (Hardy), adult male (x11).



FIGS. 245–246. *Bactrocera (Bactrocera) laticaudus* (Hardy): 245, apex of aculeus (scale 0.1 mm); 246, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



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FIG. 247. *Bactrocera* (*Bactrocera*) *lineata* (Perkins), adult male (x9). FIG. 248. *Bactrocera* (*Bactrocera*) *longicornis* (Macquart), adult male (x9).

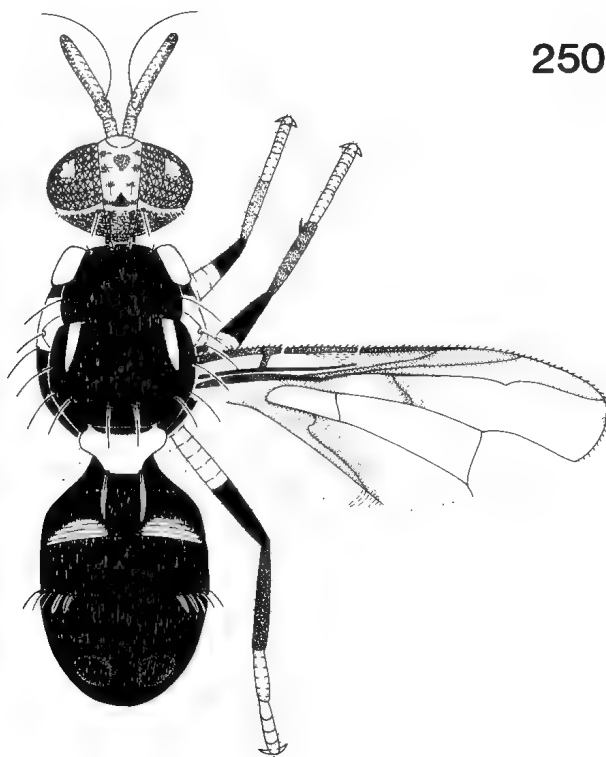
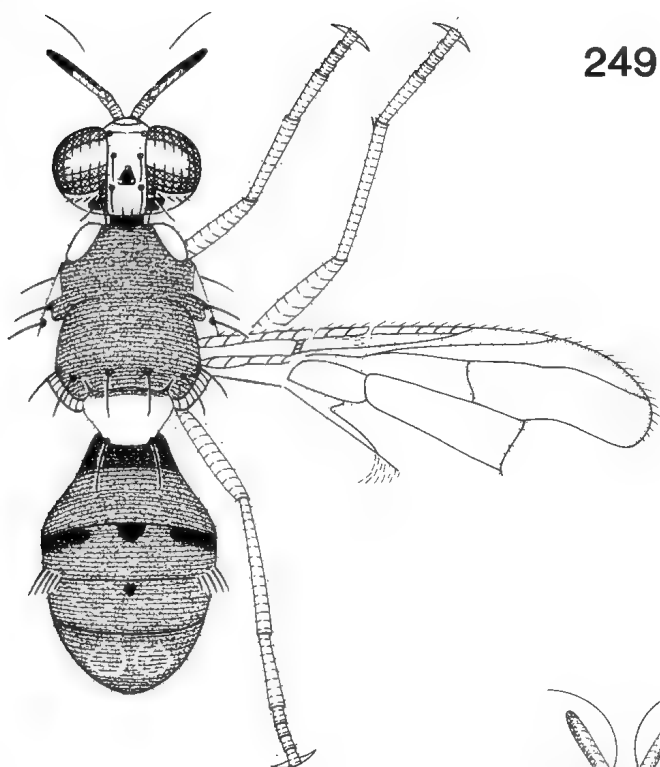
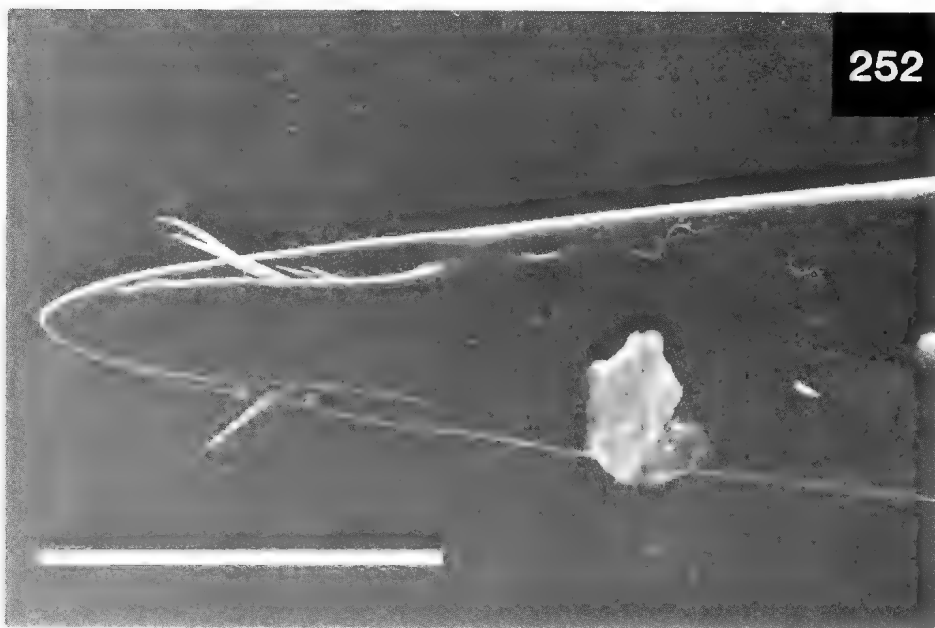
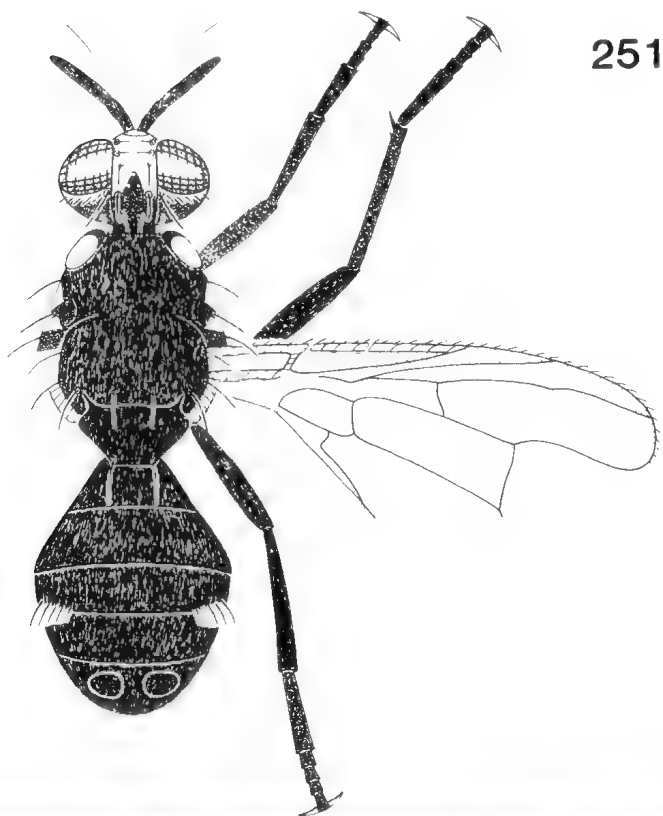


FIG. 249. *Bactrocera (Bactrocera) luteola* (Malloch), adult male (x11). FIG. 250. *Bactrocera (Bactrocera) melanogaster* n. sp., adult male (x10).



FIGS 251–252. *Bactrocera* (*Bactrocera*) *melanotus* (Coquillett): 251, adult male (x10); 252, apex of aculeus (scale 0.1 mm).

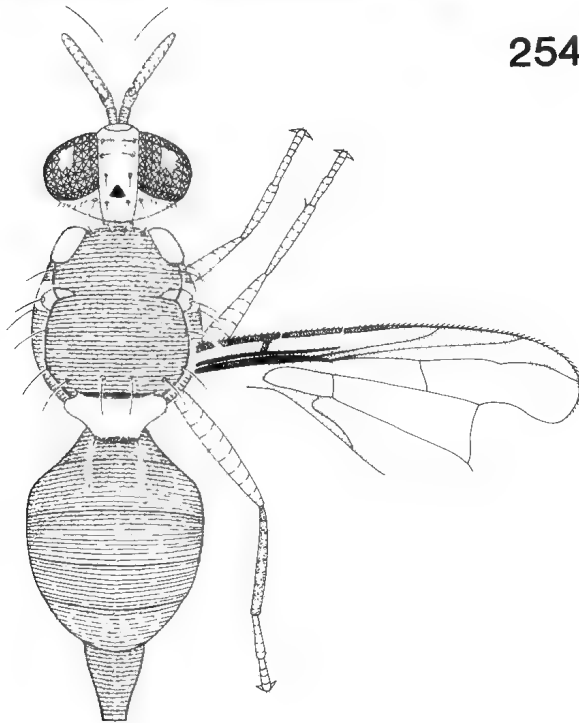
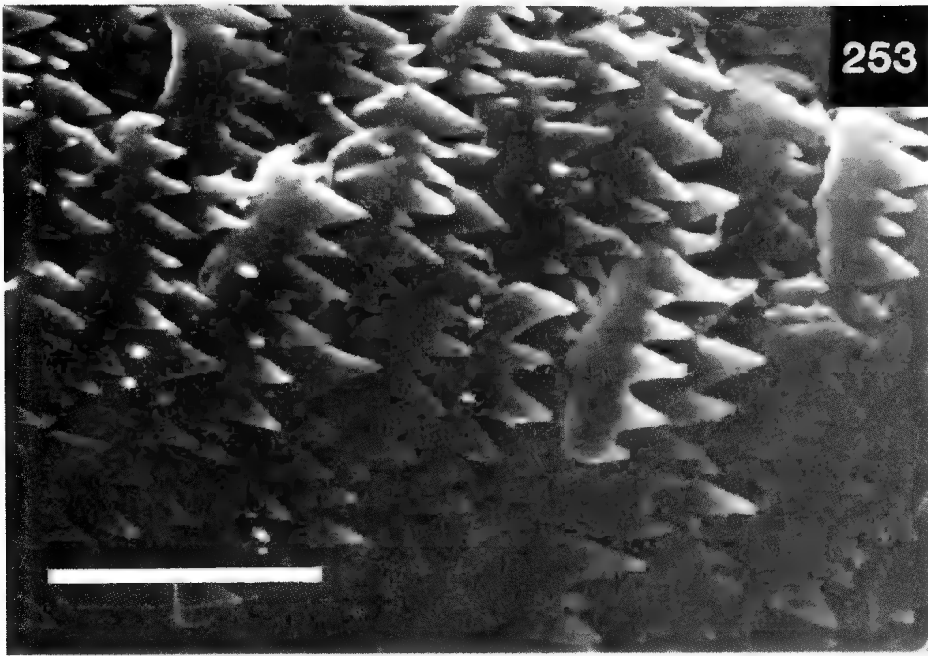
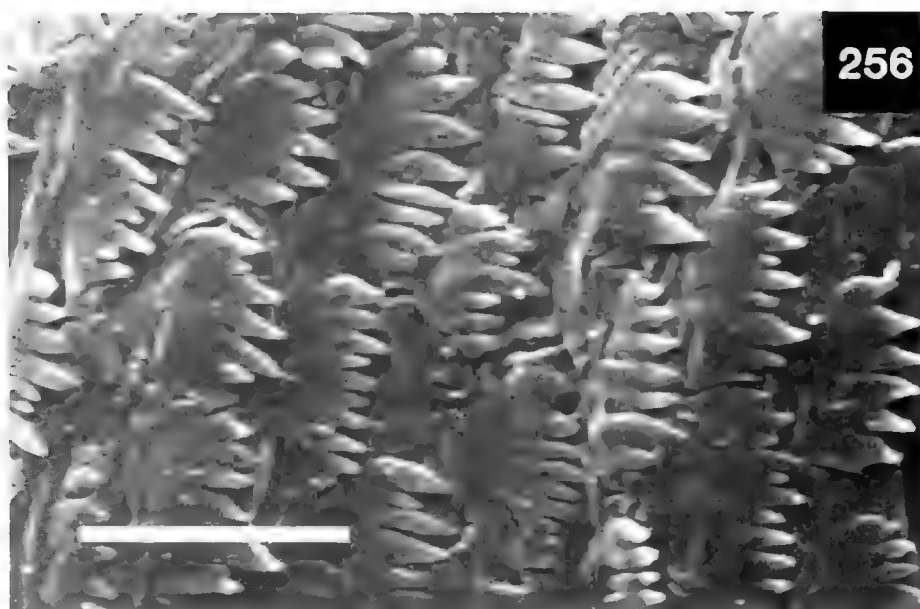
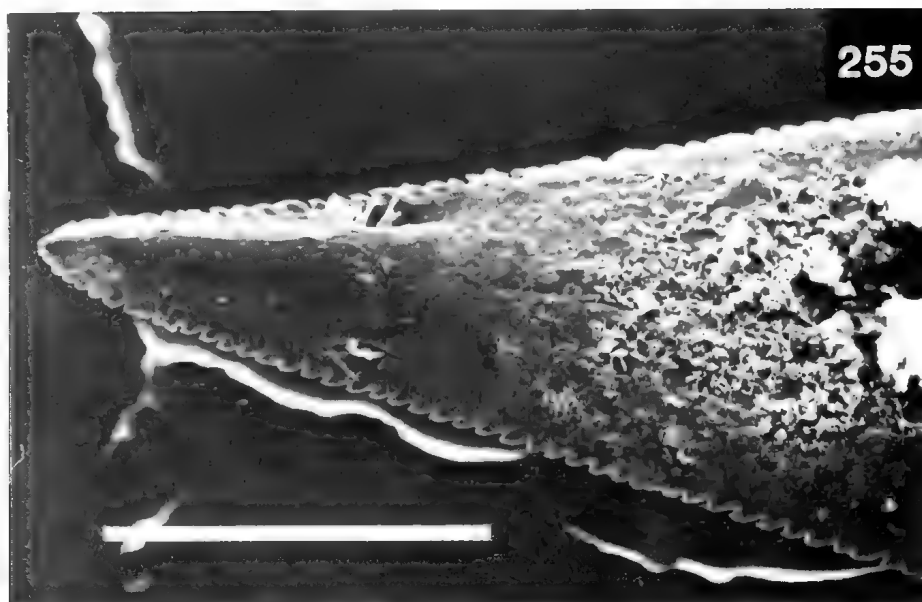
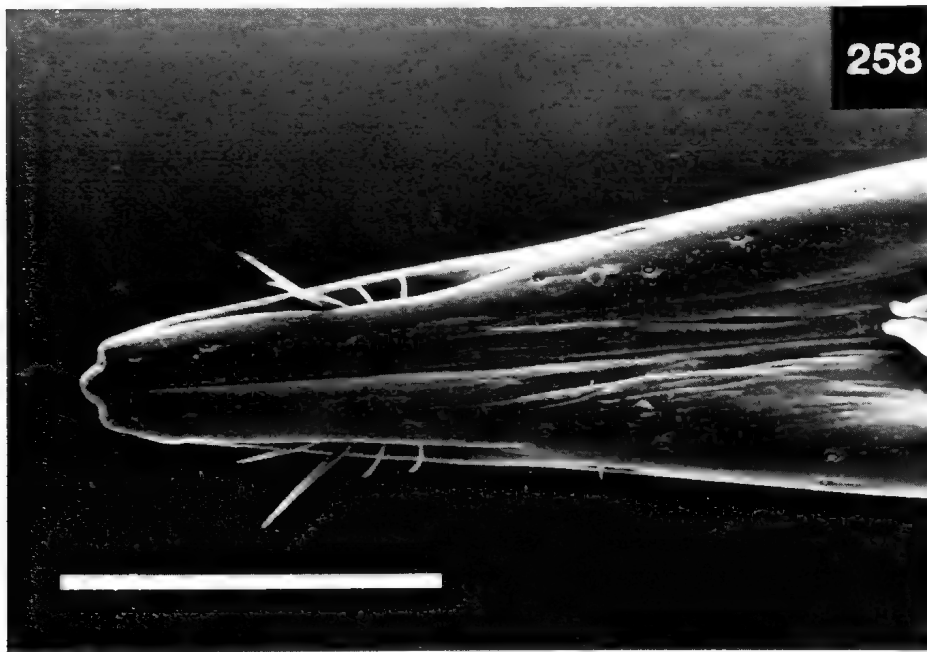
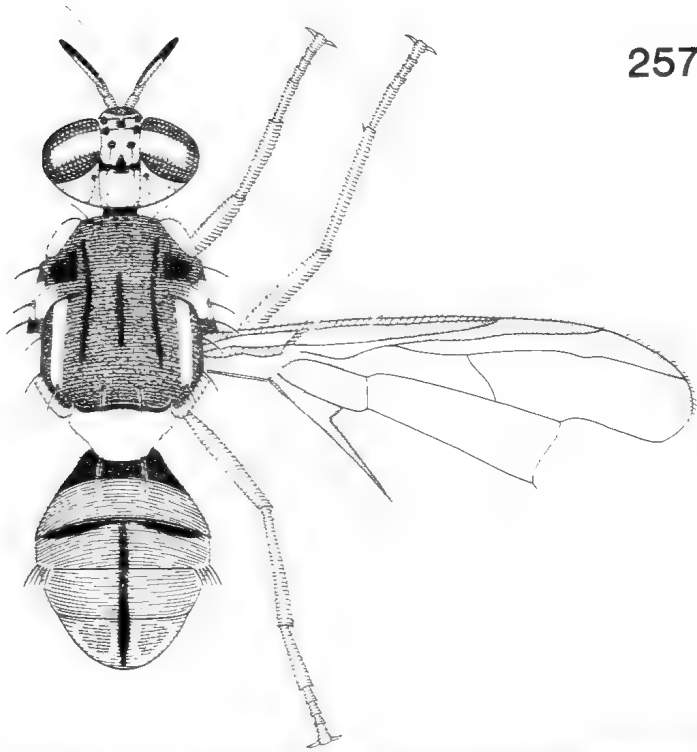


FIG. 253. *Bactrocera* (*Bactrocera*) *melanotus* (Coquillett), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 254. *Bactrocera* (*Bactrocera*) *mendosa* (May), adult female (x9).



FIGS 255–256. *Bactrocera* (*Bactrocera*) *mendosa* (May): 255, apex of aculeus (scale 0.1 mm); 256, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).



FIGS 257–258. *Bactrocera* (*Bactrocera*) *moluccensis* (Perkins): 257, adult male (x8); 258, apex of aculeus (scale 0.1 mm).

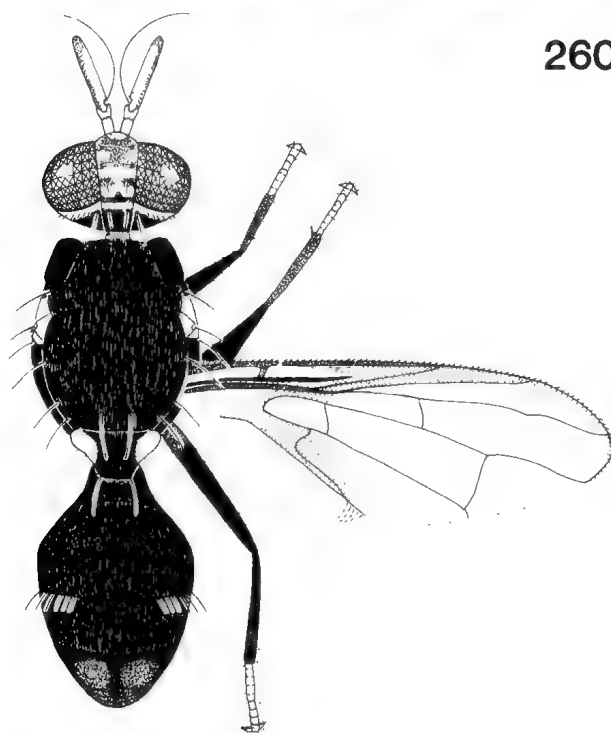
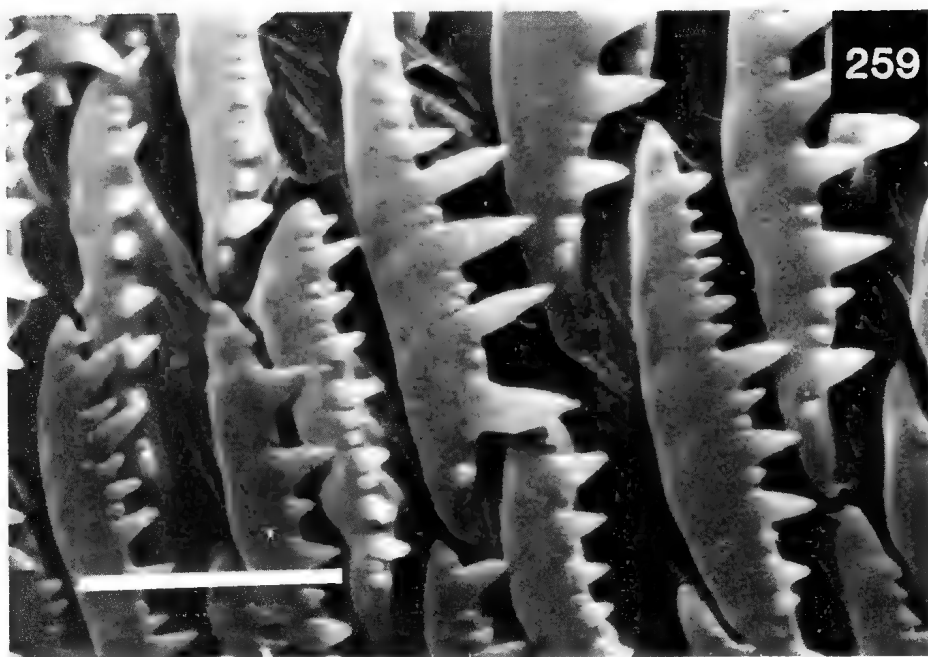
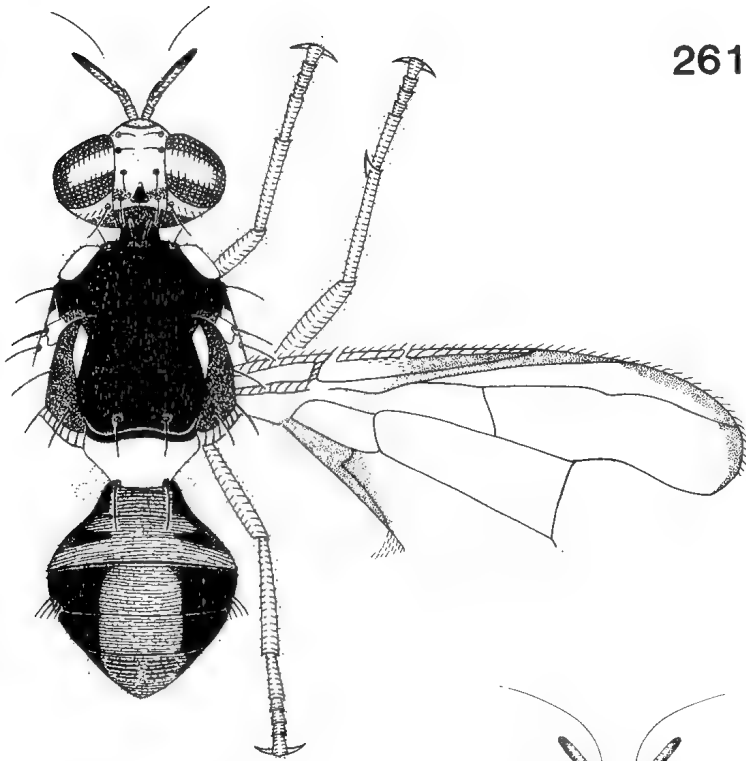
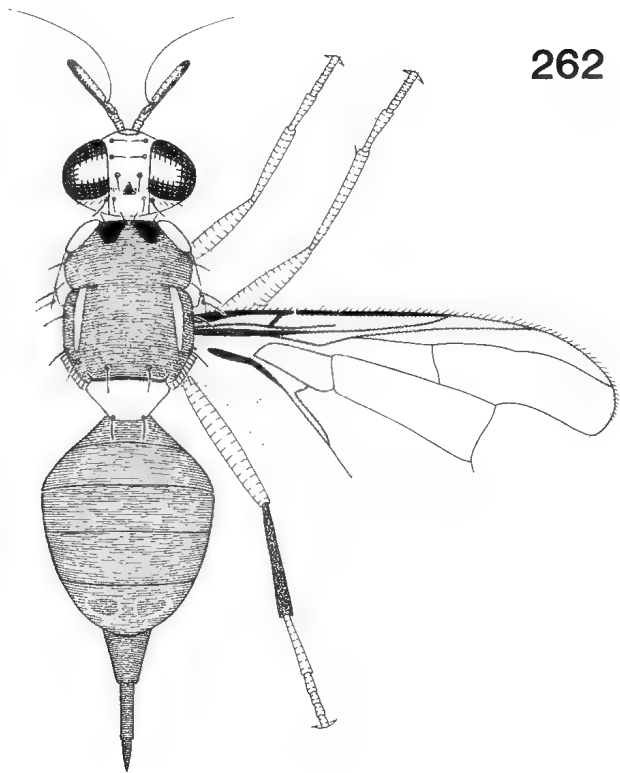


FIG. 259. *Bactrocera* (*Bactrocera*) *moluccensis* (Perkins), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 260. *Bactrocera* (*Bactrocera*) *morula* n. sp., adult male (x11).

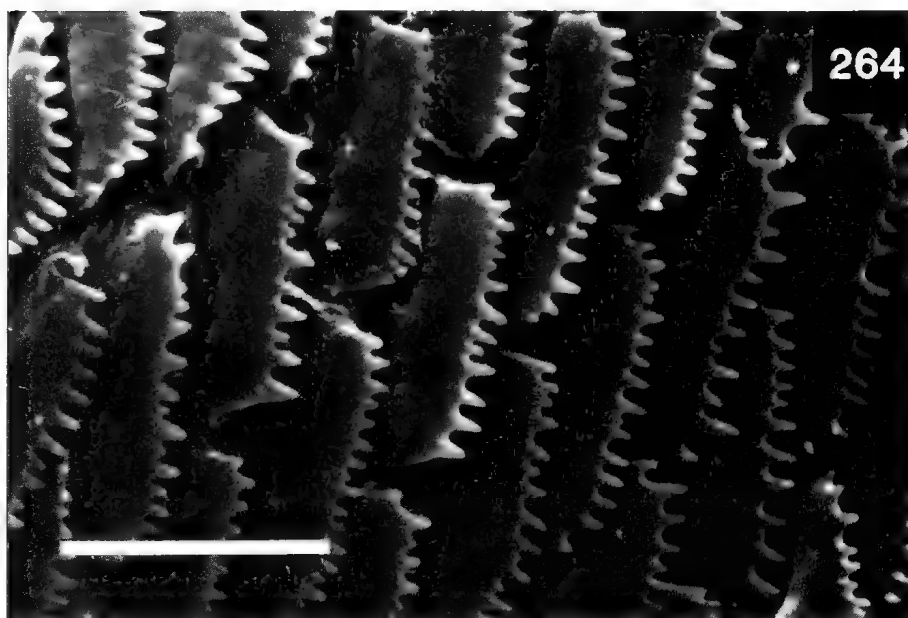
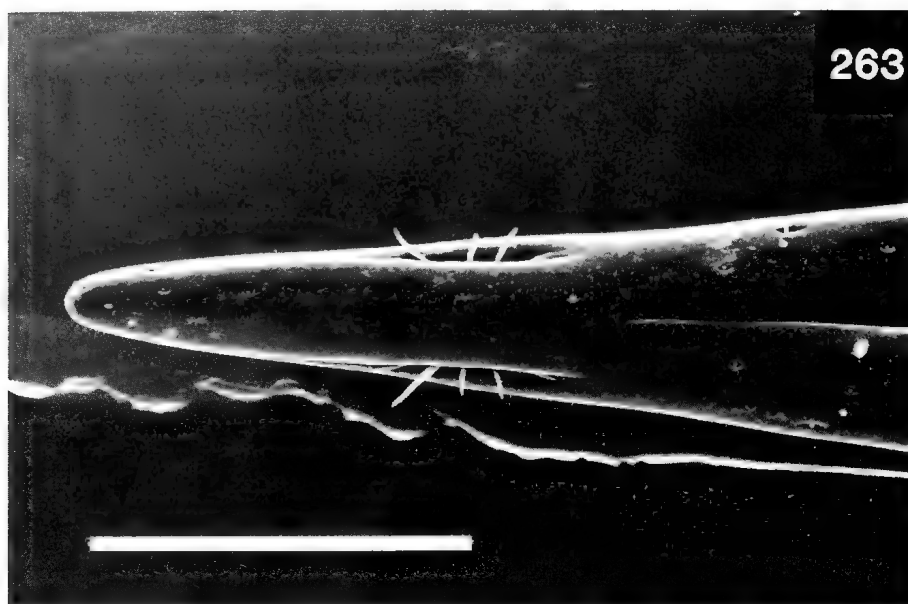


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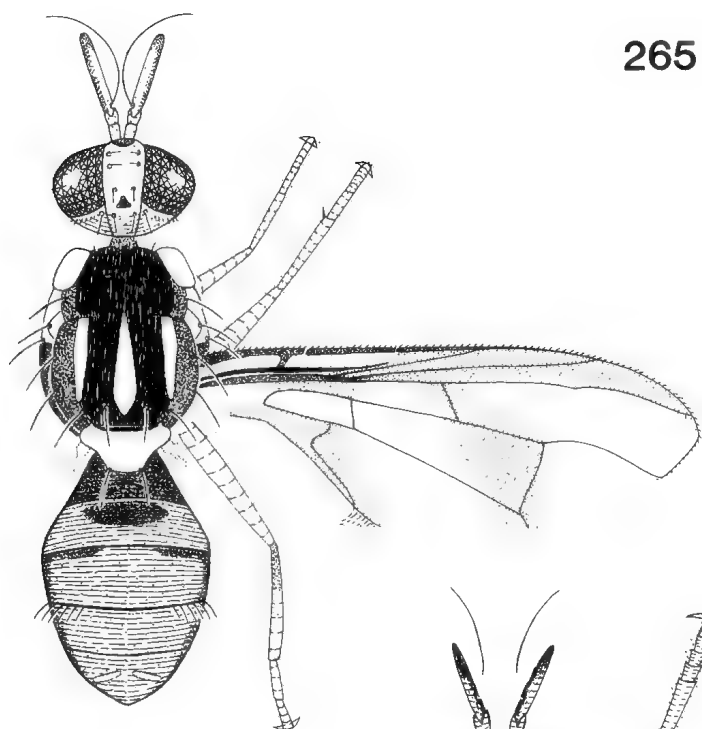


262

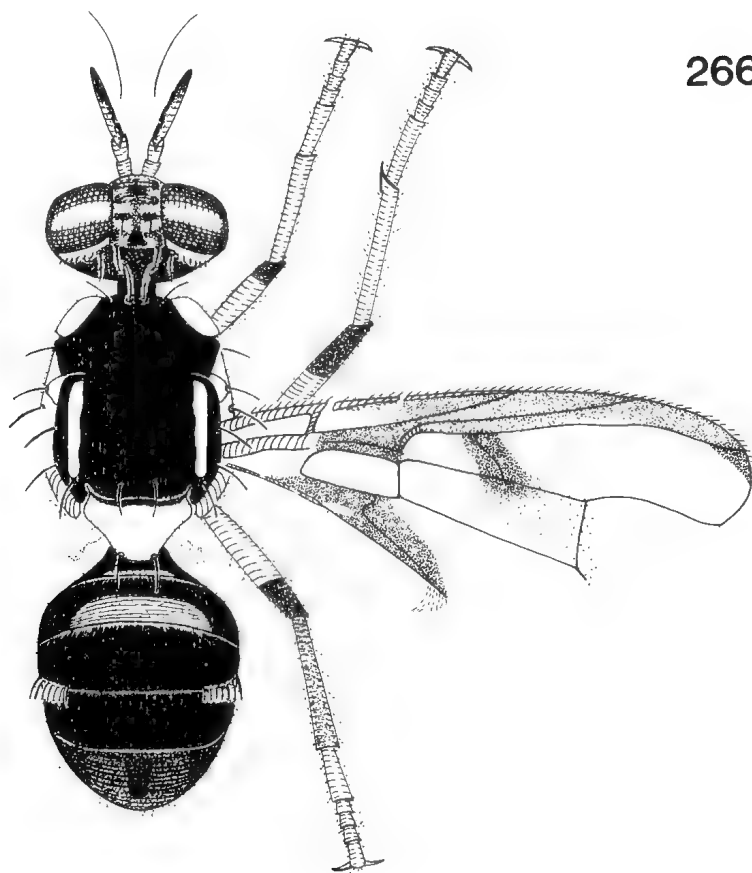
FIG. 261. *Bactrocera (Bactrocera) mucronis* (Drew), adult male (x14). FIG. 262. *Bactrocera (Bactrocera) mutabilis* (May), adult female (x9).



FIGS 263–264. *Bactrocera* (*Bactrocera*) *mutabilis* (May): 263, apex of aculeus (scale 0.1 mm); 264, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

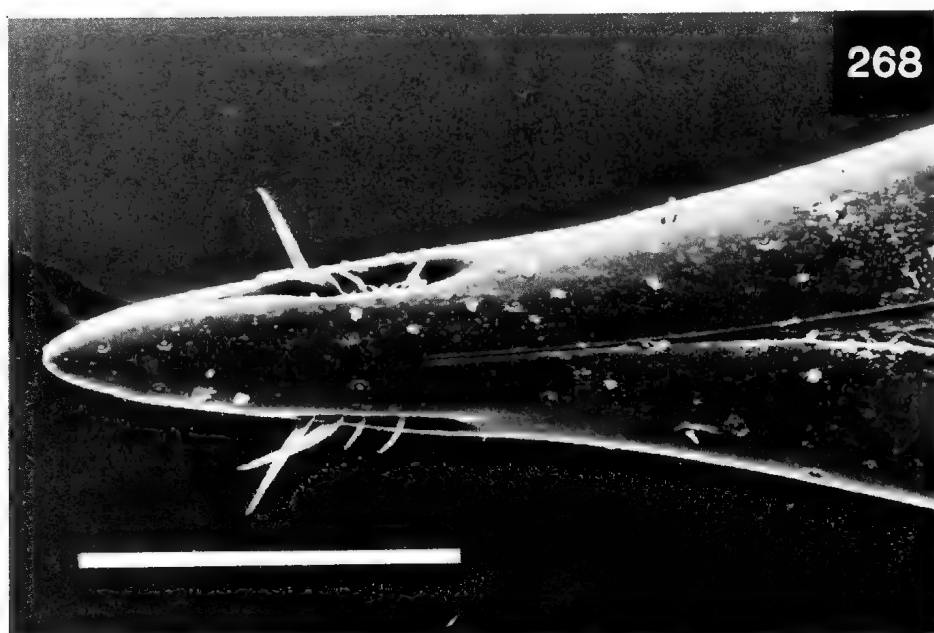
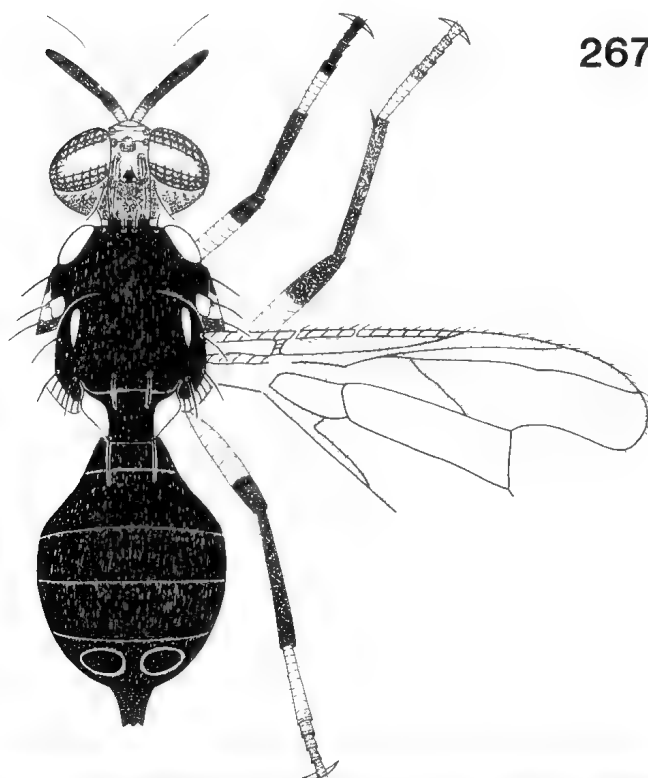


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FIG. 265. *Bactrocera* (*Bactrocera*) *neocheesmanae* n. sp., adult male (x10). FIG. 266. *Bactrocera* (*Bactrocera*) *neonigrita* n. nom., adult male (x13).



FIGS 267–268. *Bactrocera* (*Bactrocera*) *obliqua* (Malloch): 267, adult female (x10); 268, apex of aculeus (scale 0.1 mm).

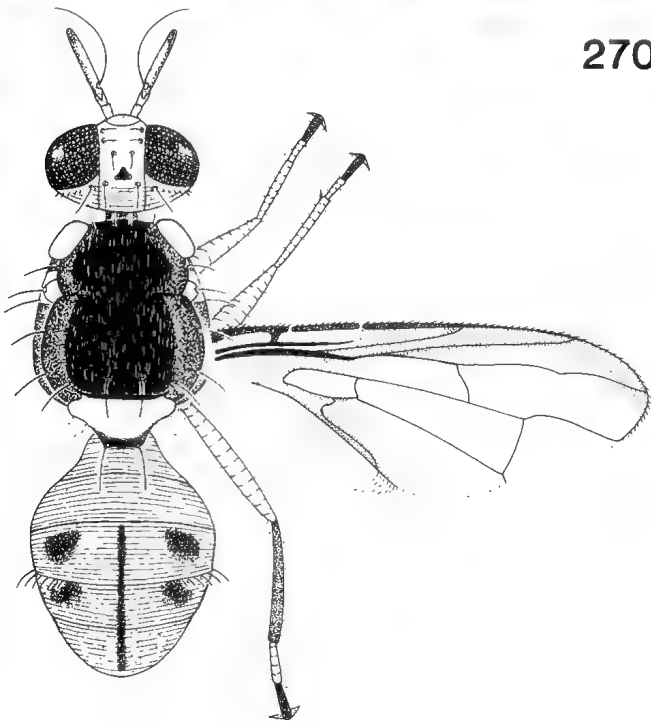
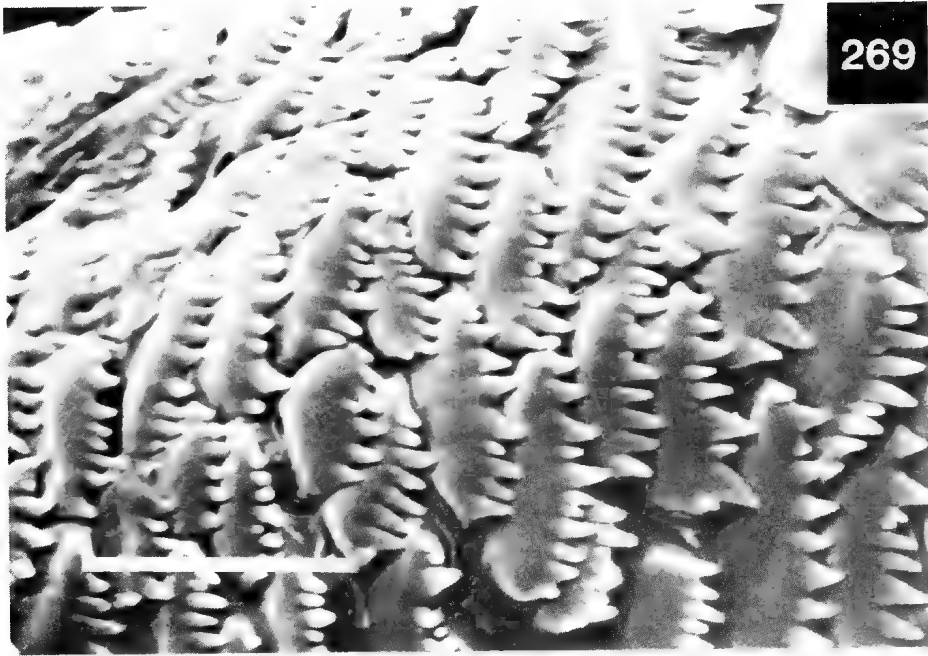
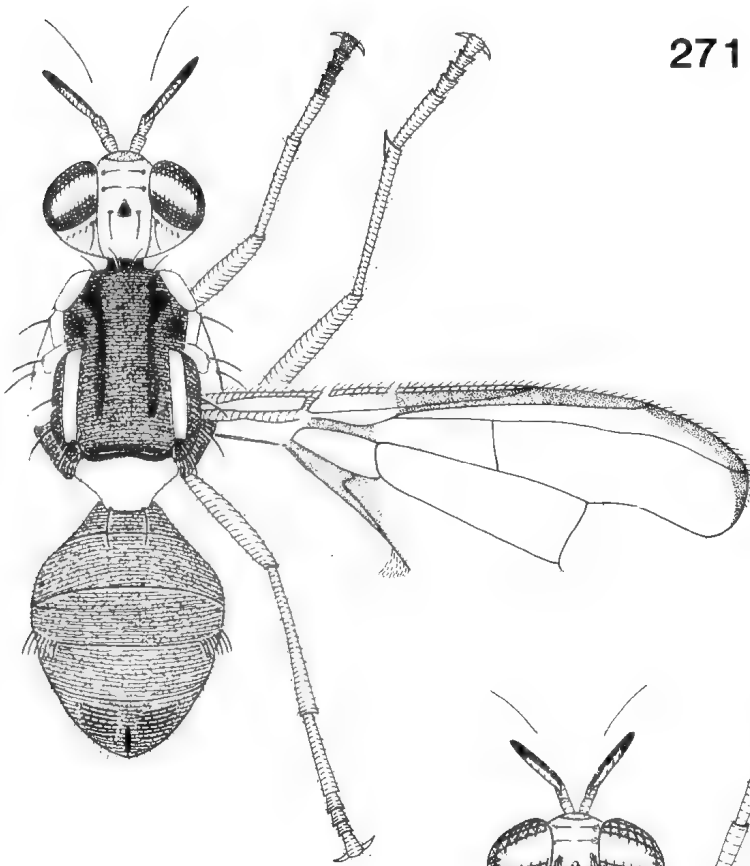
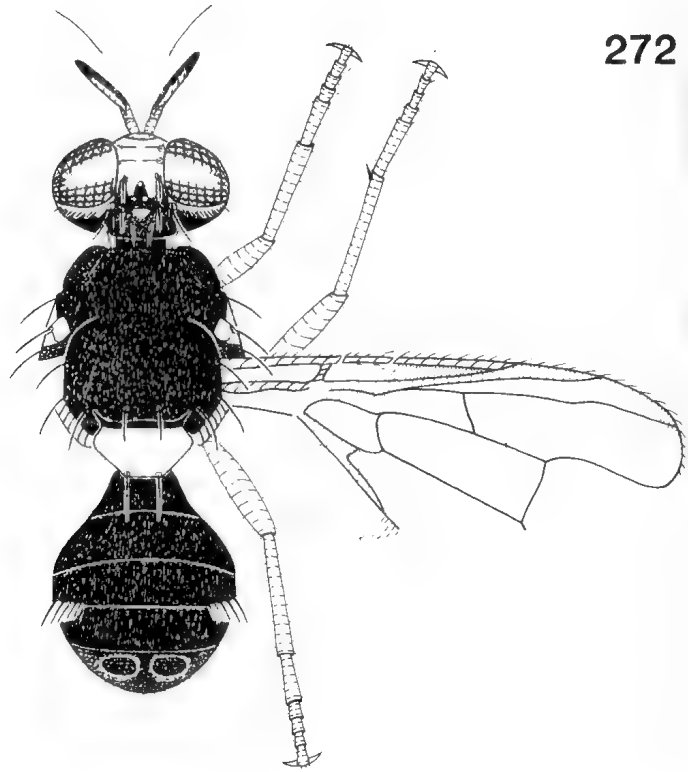


FIG. 269. *Bactrocera (Bactrocera) obliqua* (Malloch), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 270. *Bactrocera (Bactrocera) obscura* (Malloch), adult male (x9).

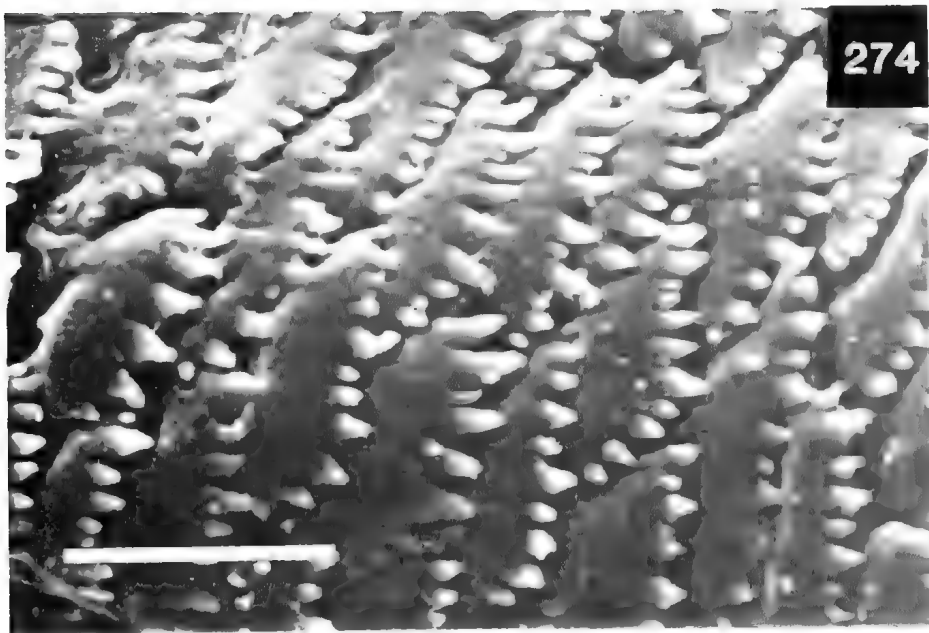
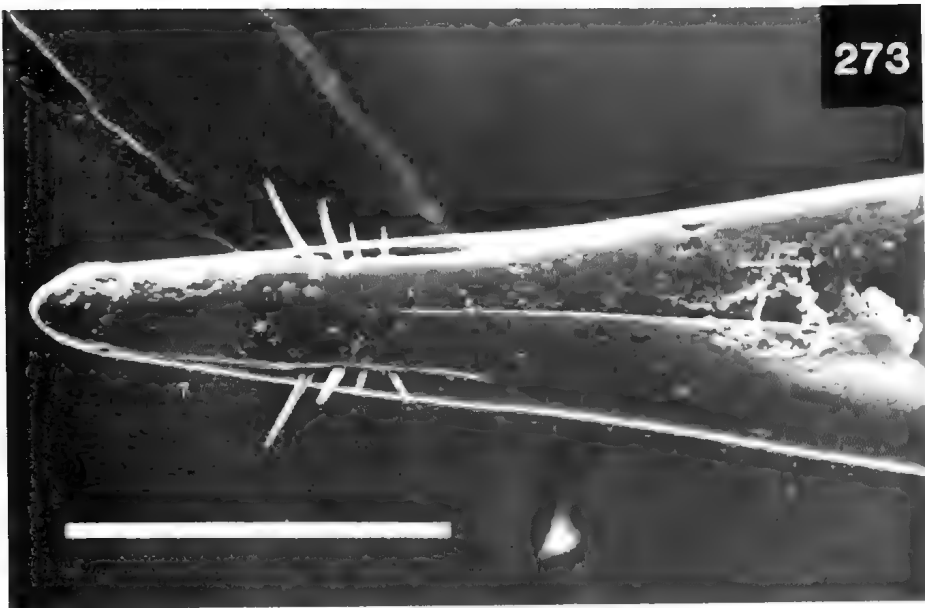


271

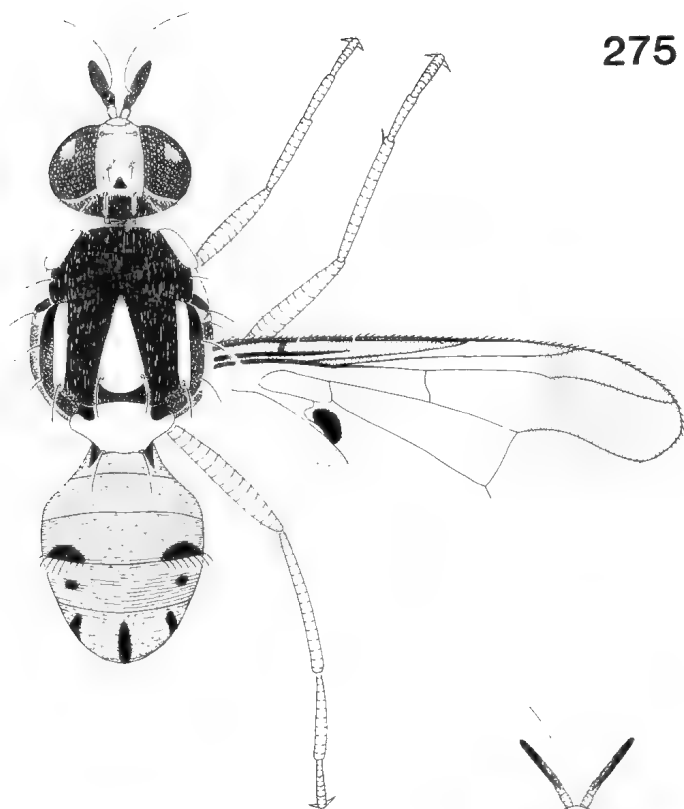


272

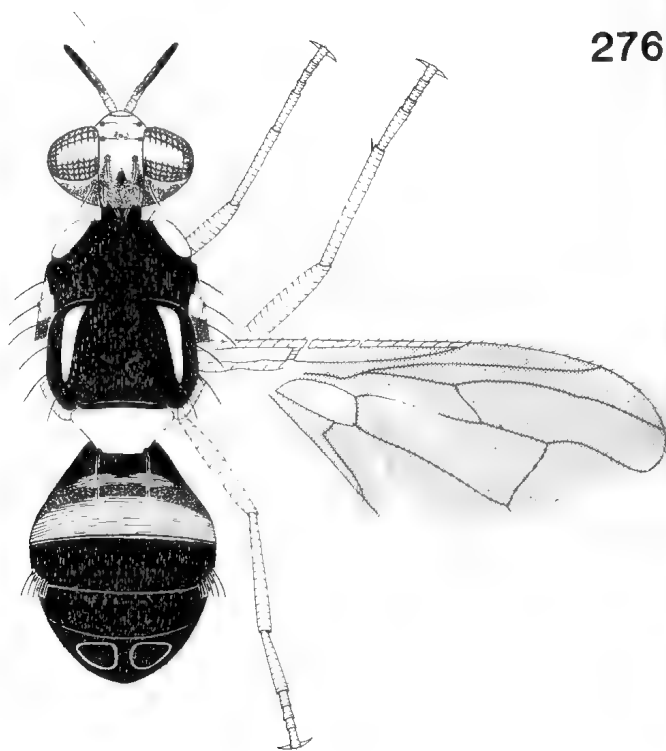
FIG. 271. *Bactrocera* (*Bactrocera*) *ochromarginis* (Drew), adult male (x12). FIG. 272. *Bactrocera* (*Bactrocera*) *passiflorae* (Froggatt), adult male (x13).



FIGS 273—274. *Bactrocera (Bactrocera) passiflorae* (Froggatt): 273, apex of aculeus (scale 0.1 mm); 274, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

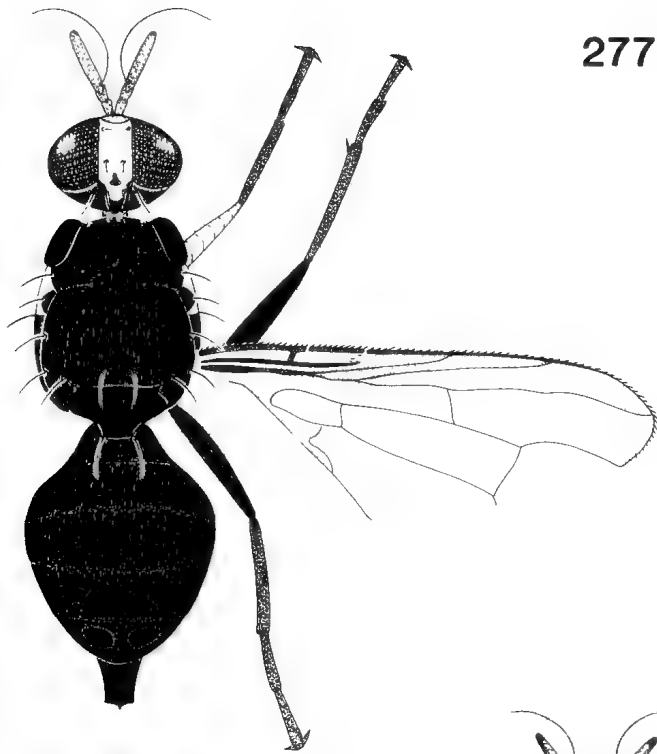


275

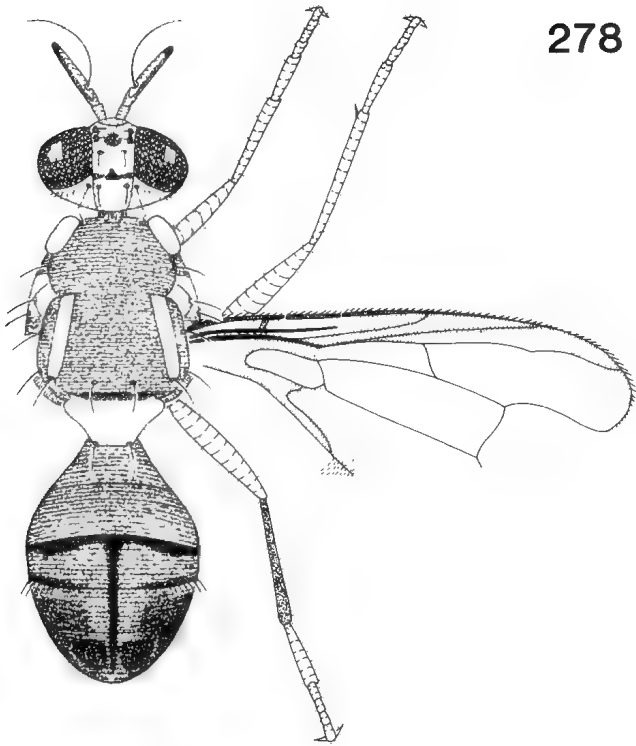


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FIG. 275. *Bactrocera* (*Bactrocera*) *penefurva* n. sp., adult male (x14). FIG. 276. *Bactrocera* (*Bactrocera*) *pepisalae* (Froggatt), adult male (x6).

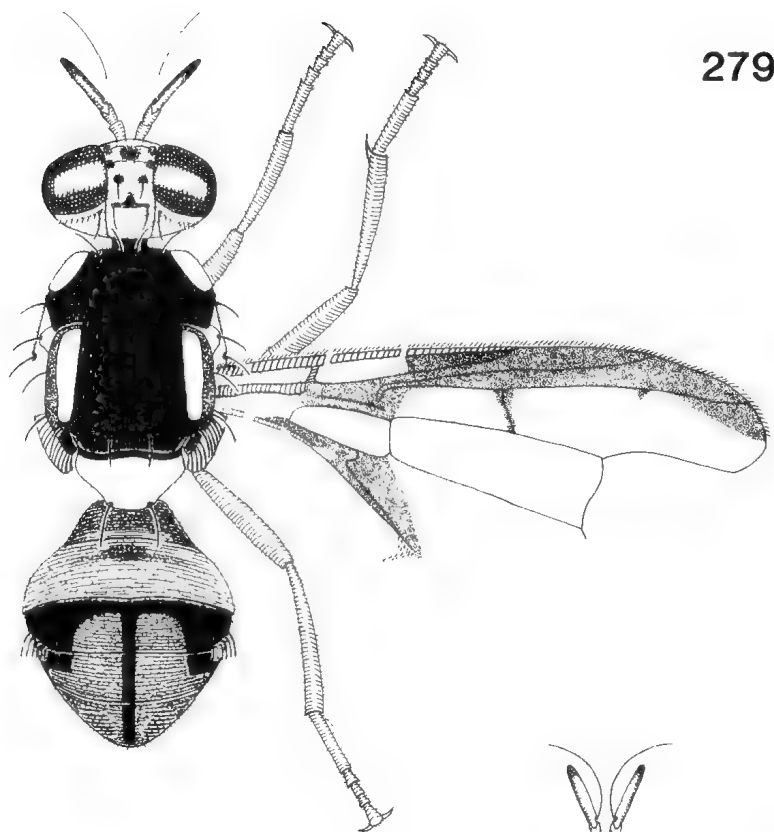


277

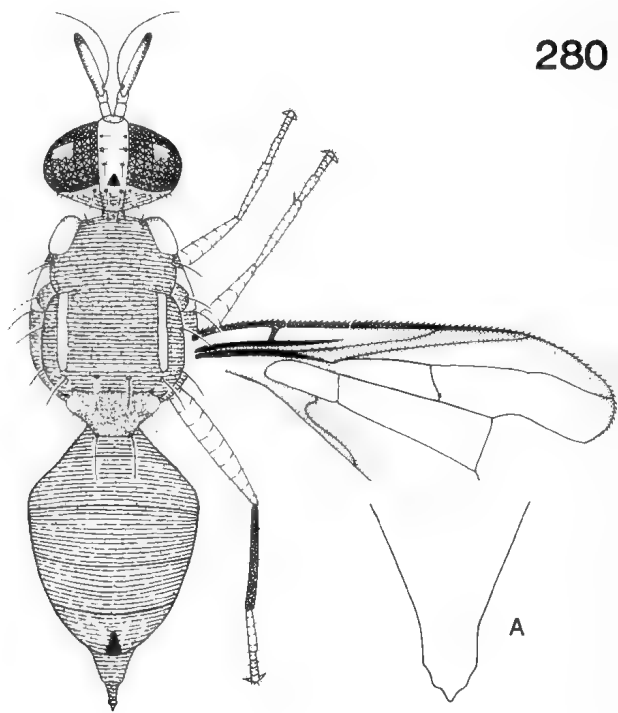


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FIG. 277. *Bactrocera (Bactrocera) perfusca* (Aubertin), adult female (x8). FIG. 278. *Bactrocera (Bactrocera) perkinsi* (Drew and Hancock), adult male (x8).

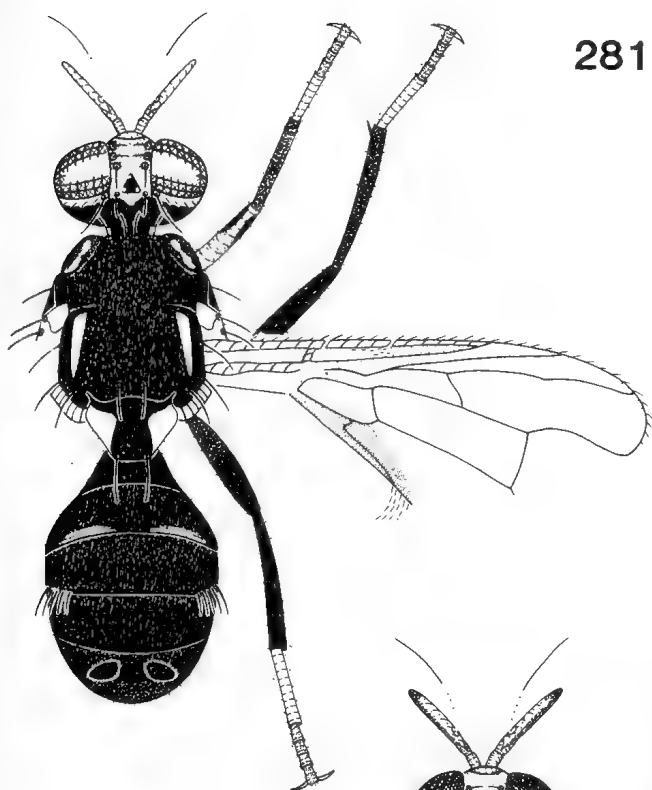


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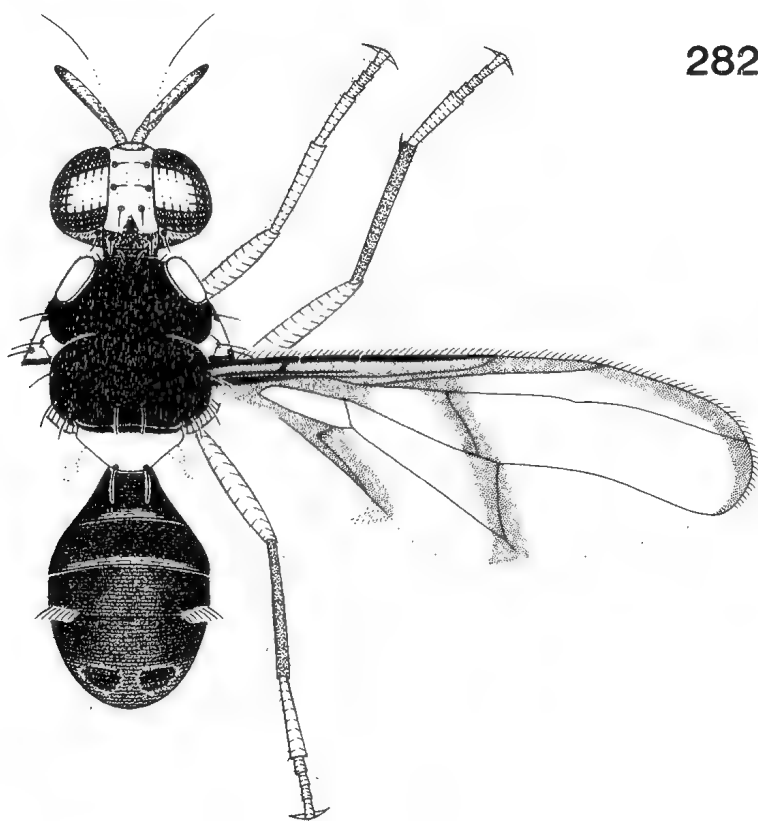


280

FIG. 279. *Bactrocera* (*Bactrocera*) *phaea* (Drew), adult male (x10). FIG. 280. *Bactrocera* (*Bactrocera*) *phaleriae* (May), adult female (x10). A, apex of aculeus.

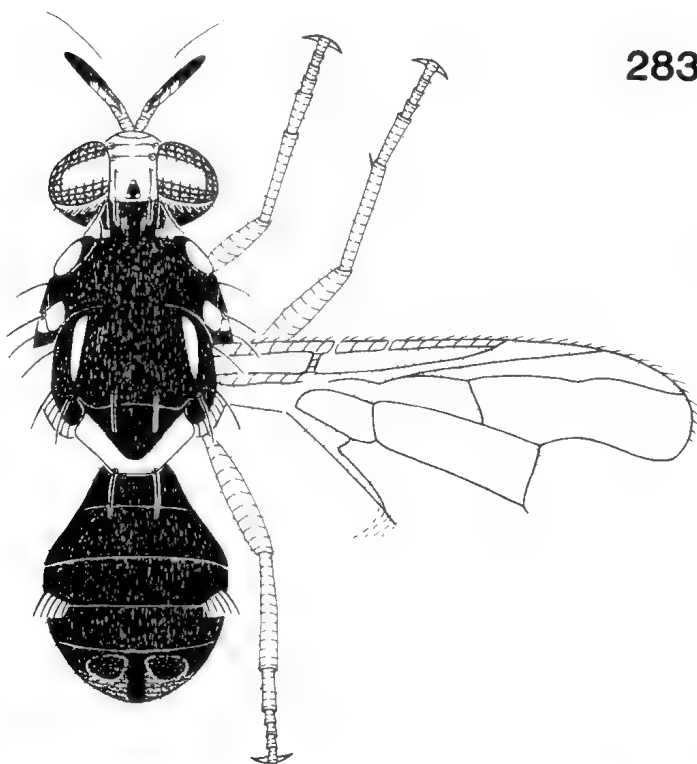


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FIG. 281. *Bactrocera* (*Bactrocera*) *picea* (Drew), adult male (x11). FIG. 282. *Bactrocera* (*Bactrocera*) *pininna* n. sp., adult male (x19).



FIGS 283–284. *Bactrocera* (*Bactrocera*) *psidii* (Froggatt): 283, adult male (x11); 284, apex of aculeus (scale 0.1 mm).

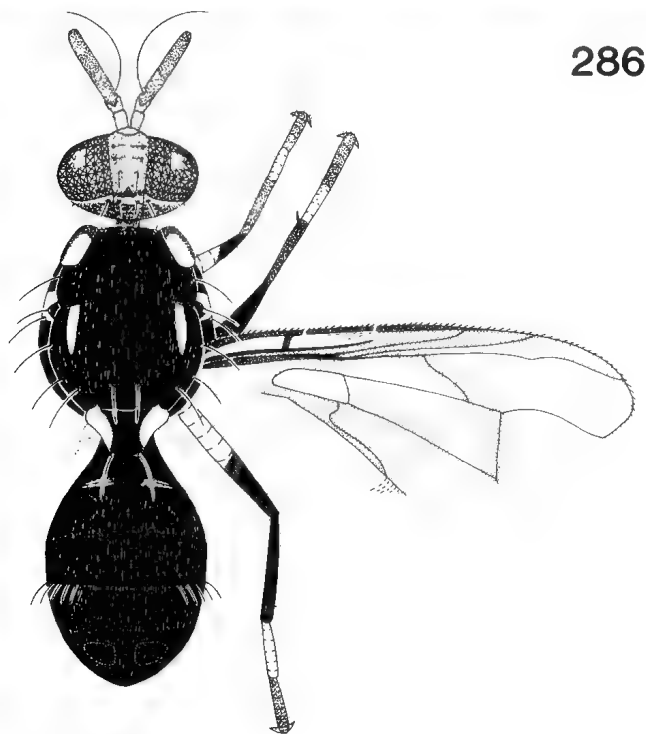
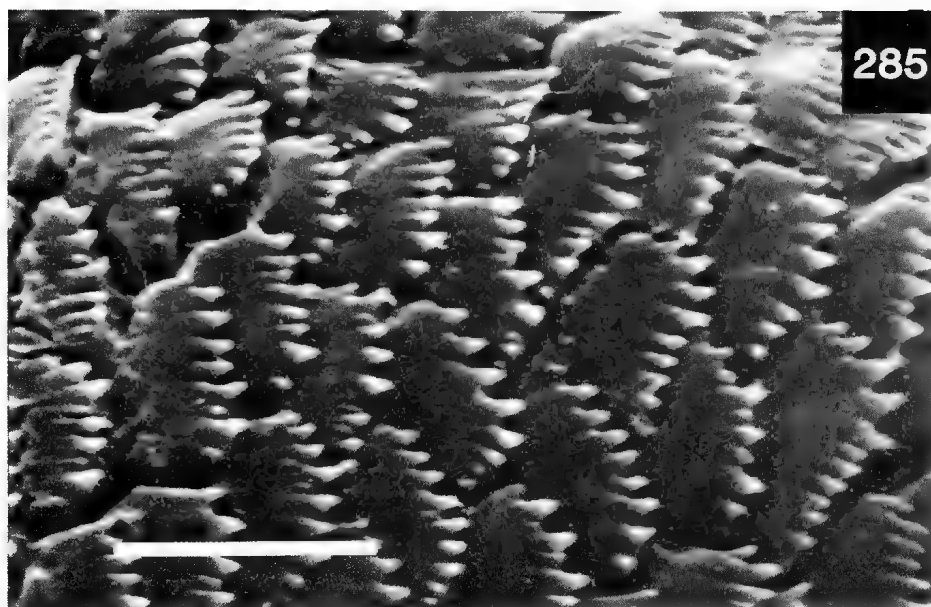
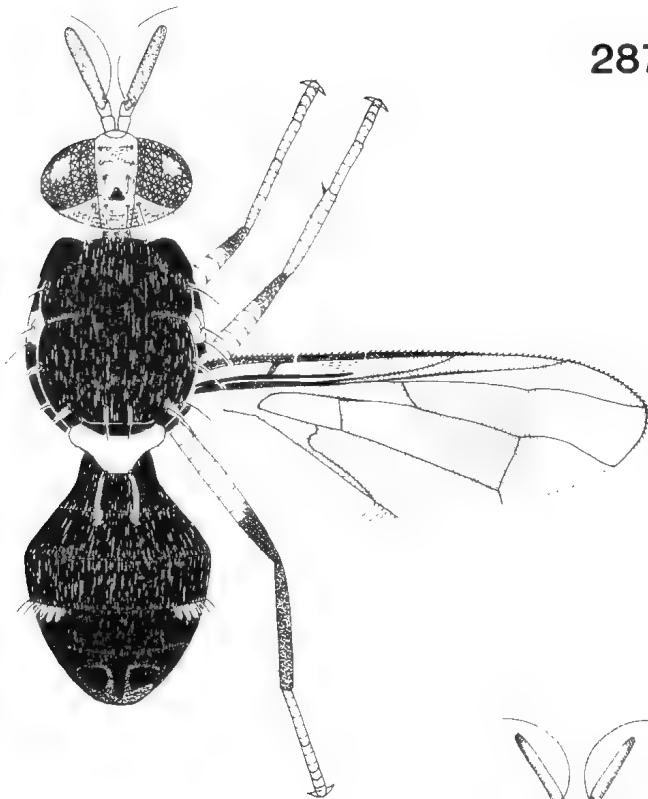
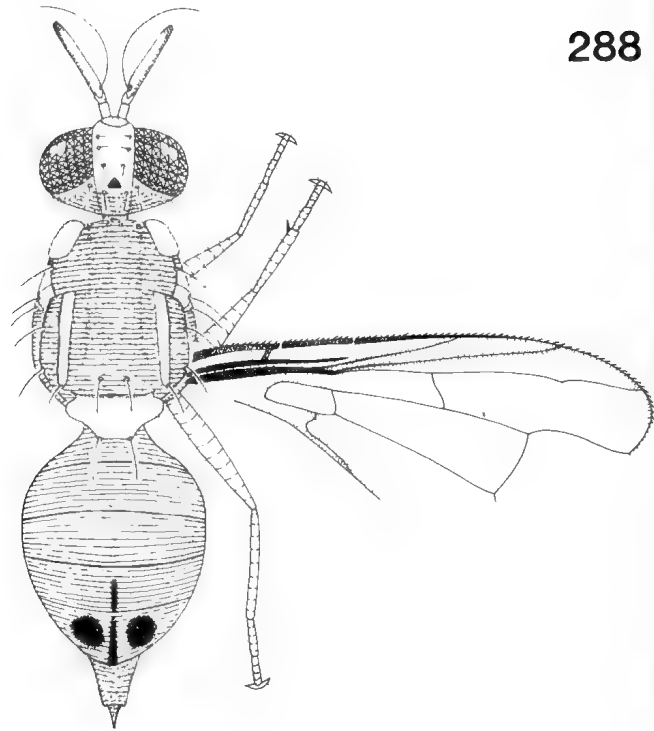


FIG. 285. *Bactrocera (Bactrocera) psidii* (Froggatt), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 286. *Bactrocera (Bactrocera) reclinata* n. sp., adult male (x8).

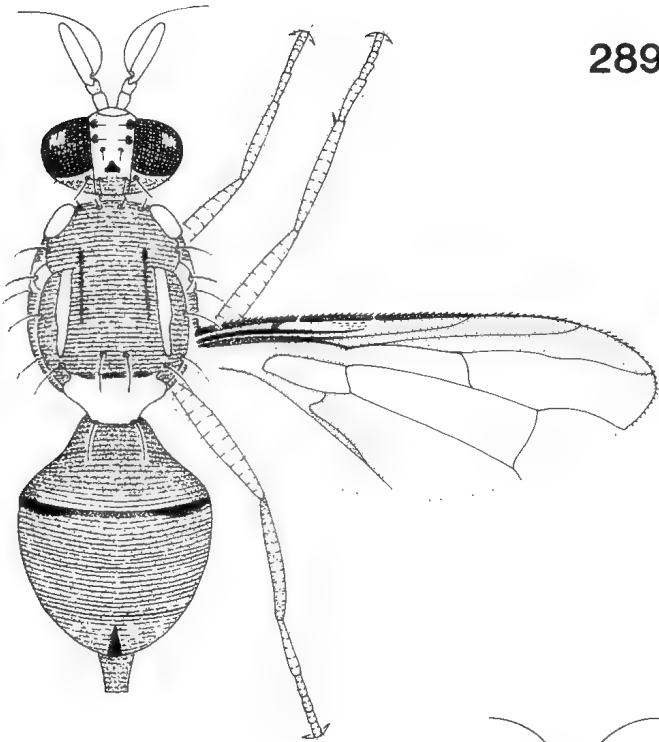


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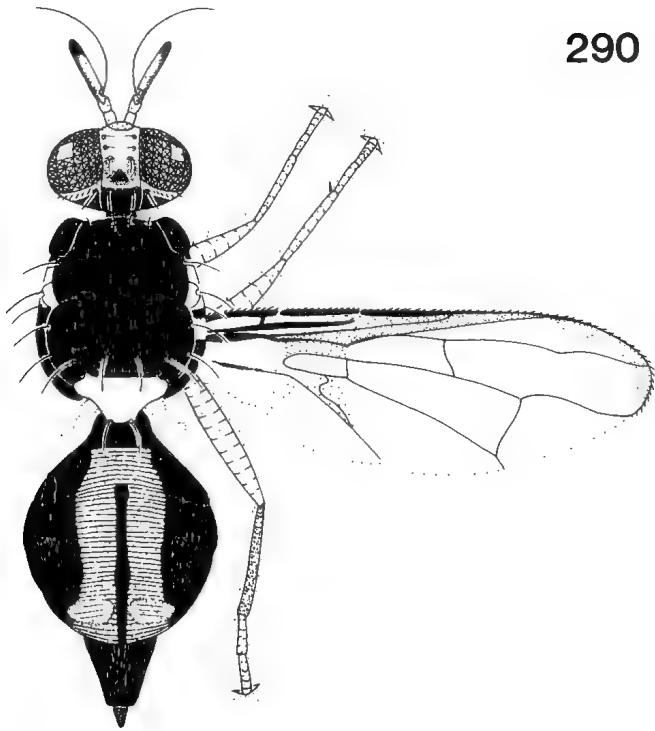


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FIG. 287. *Bactrocera* (*Bactrocera*) *retrorsa* n. sp., adult male (x8). FIG. 288. *Bactrocera* (*Bactrocera*) *robiginosa* (May), adult female (x9).

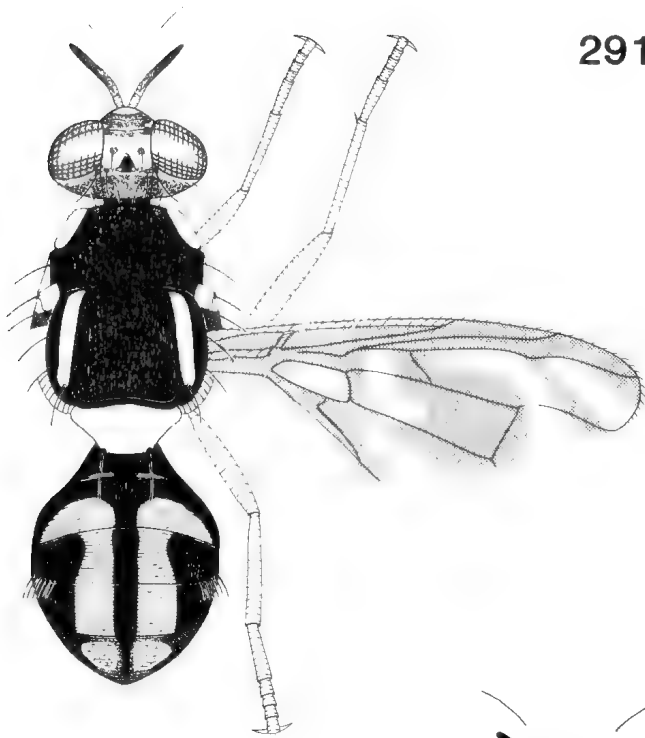


289

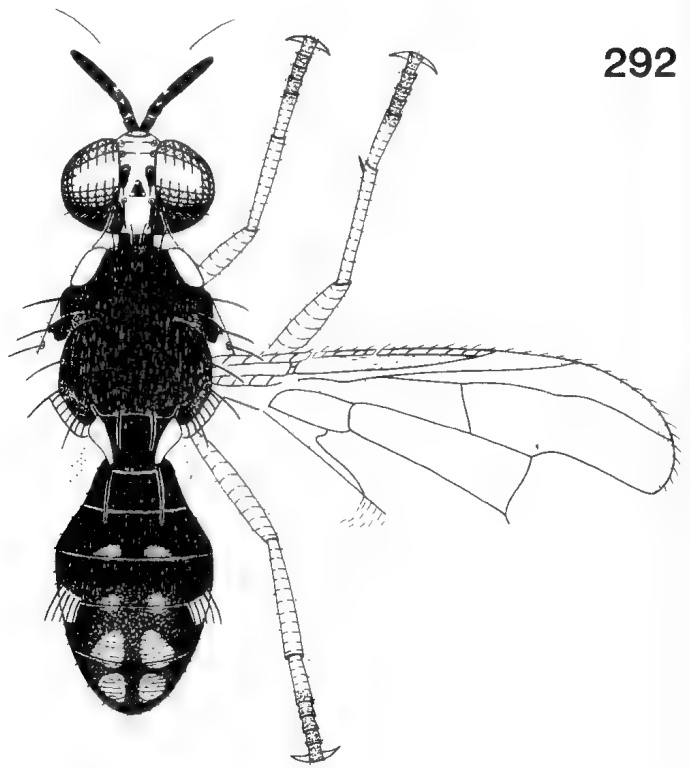


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FIG. 289. *Bactrocera* (*Bactrocera*) *rutila* (Hering), adult female (x11). FIG. 290. *Bactrocera* (*Bactrocera*) *samoae* n. sp., adult female (x13).

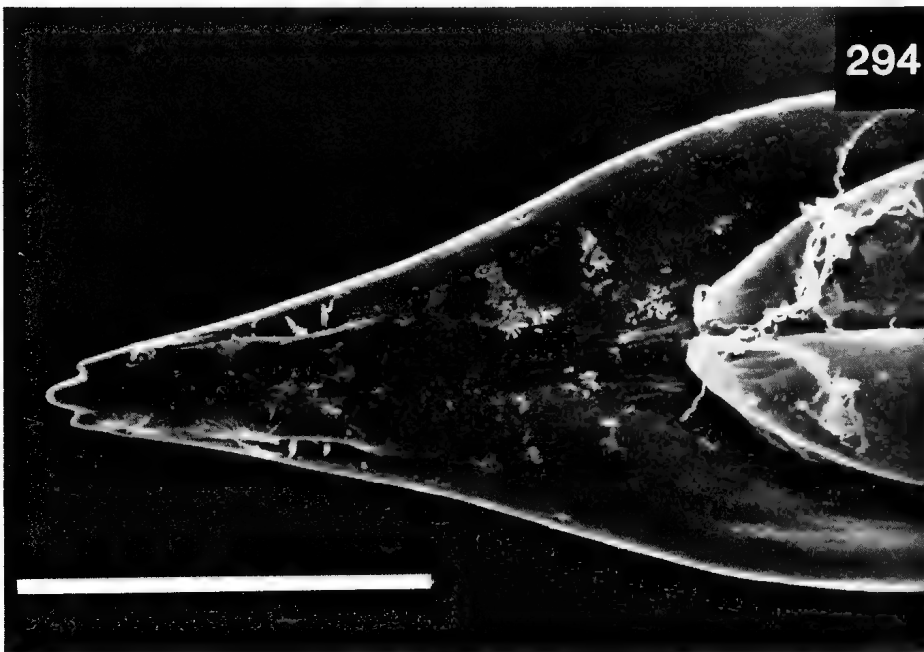
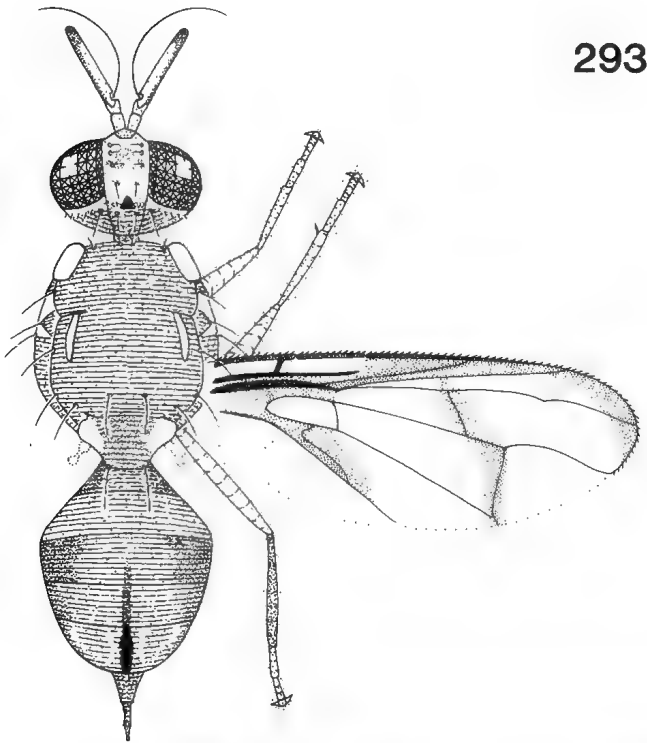


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FIG. 291. *Bactrocera* (*Bactrocera*) *seguyi* (Hering), adult male (x7). FIG. 292. *Bactrocera* (*Bactrocera*) *setinervis* (Malloch), adult male (x10).



FIGS 293–294. *Bactrocera* (*Bactrocera*) *strigata* (Perkins): 293, adult female (x10); 294, apex of aculeus (scale 0.1 mm).

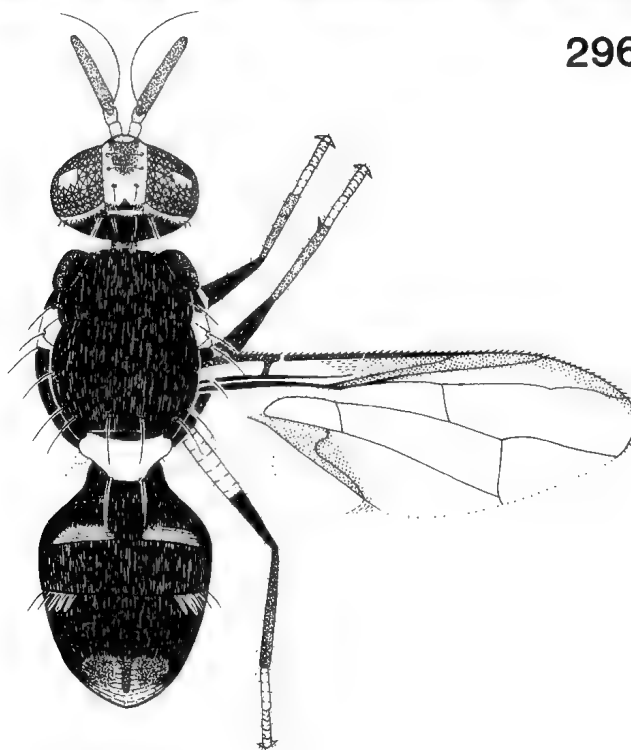
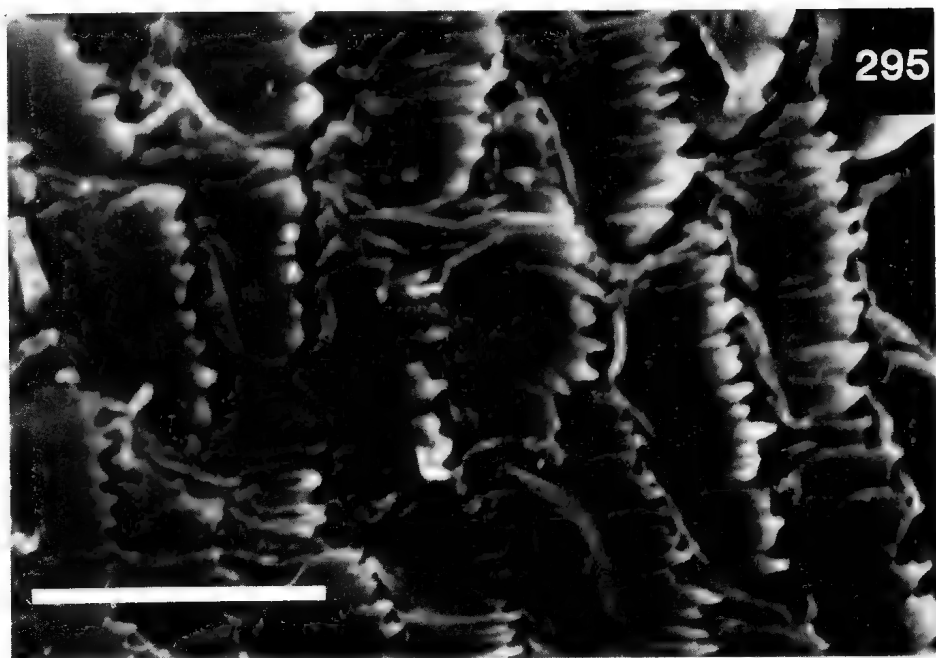
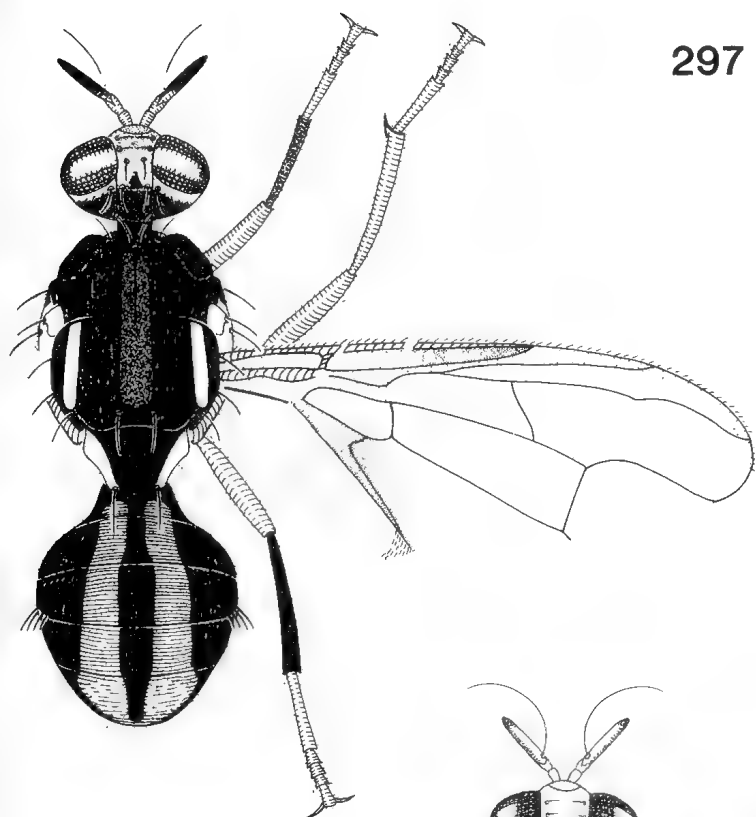
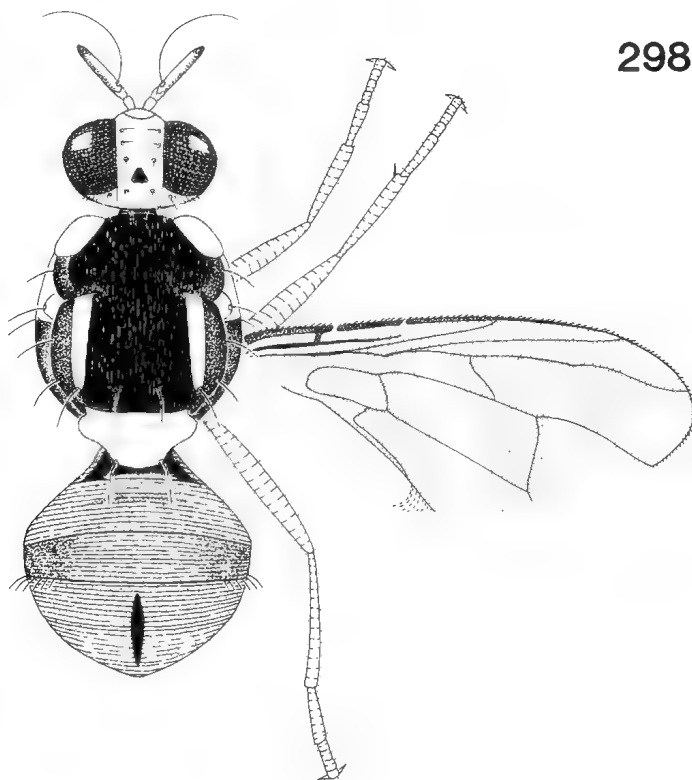


FIG. 295. *Bactrocera* (*Bactrocera*) *strigata* (Perkins), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 296. *Bactrocera* (*Bactrocera*) *thistletoni* n. sp., adult male (x10).

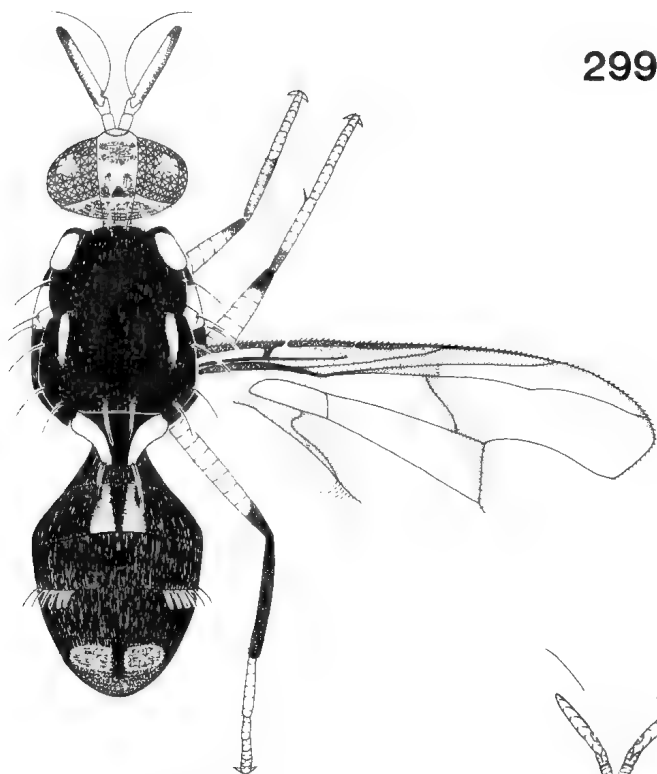


297

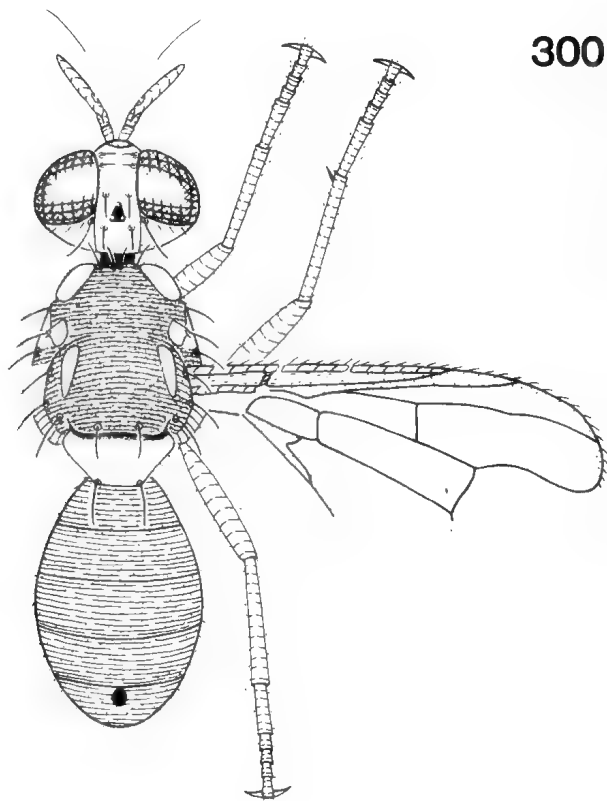


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FIG. 297. *Bactrocera* (*Bactrocera*) *trifaria* (Drew), adult male (x12). FIG. 298. *Bactrocera* (*Bactrocera*) *umbrosa* (Fabricius), adult male (x9).

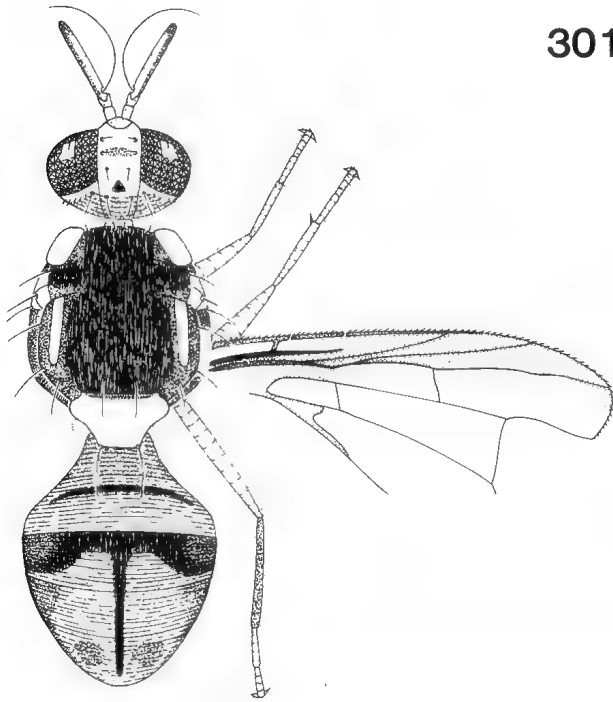


299

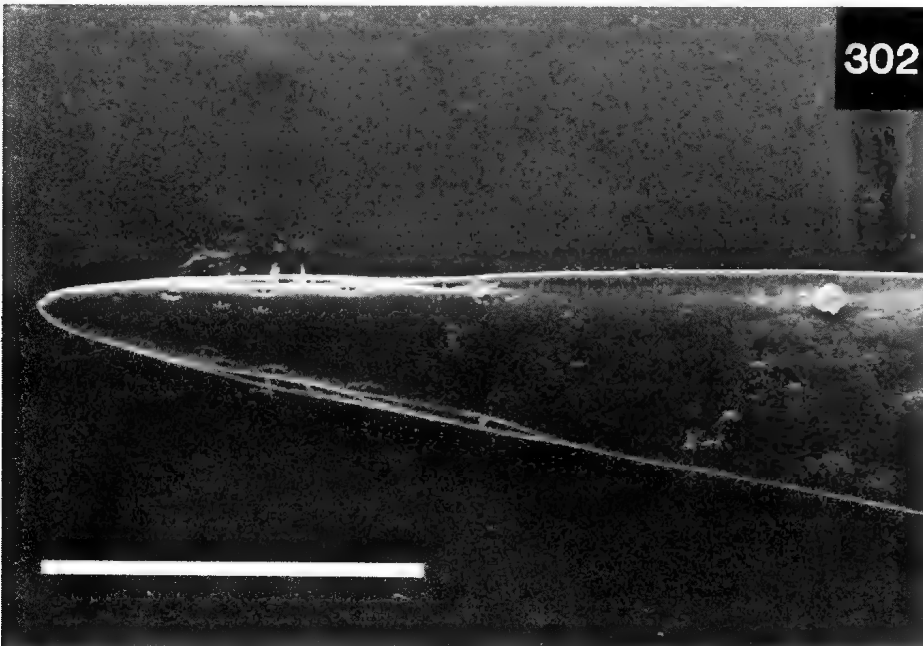


300

FIG. 299. *Bactrocera* (*Bactrocera*) *unilineata* n. sp., adult male (x10). FIG. 300. *Bactrocera* (*Bactrocera*) *unipunctata* (Malloch), adult male (x14).



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FIGS 301–302. *Bactrocera (Gymnodacus) calophylli* (Perkins and May): 301, adult male (x12); 302, apex of aculeus (scale 0.1 mm).

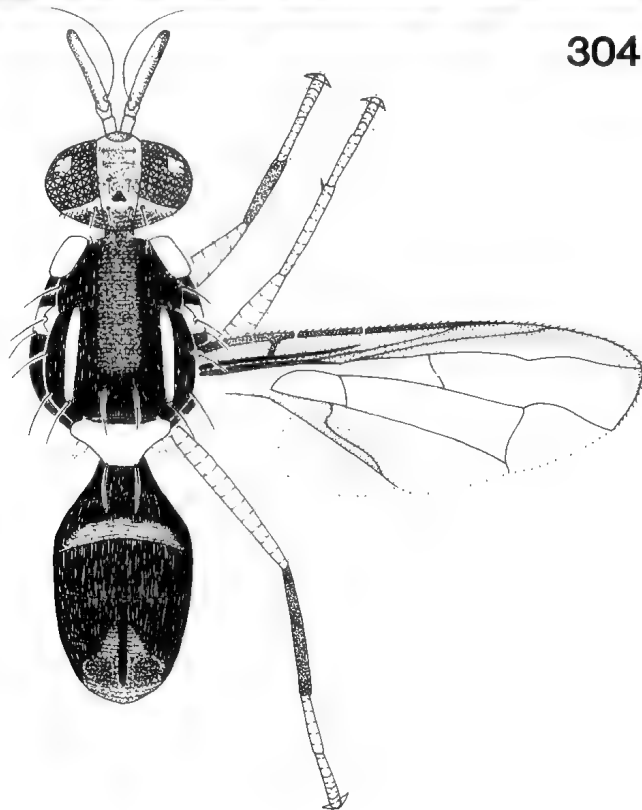
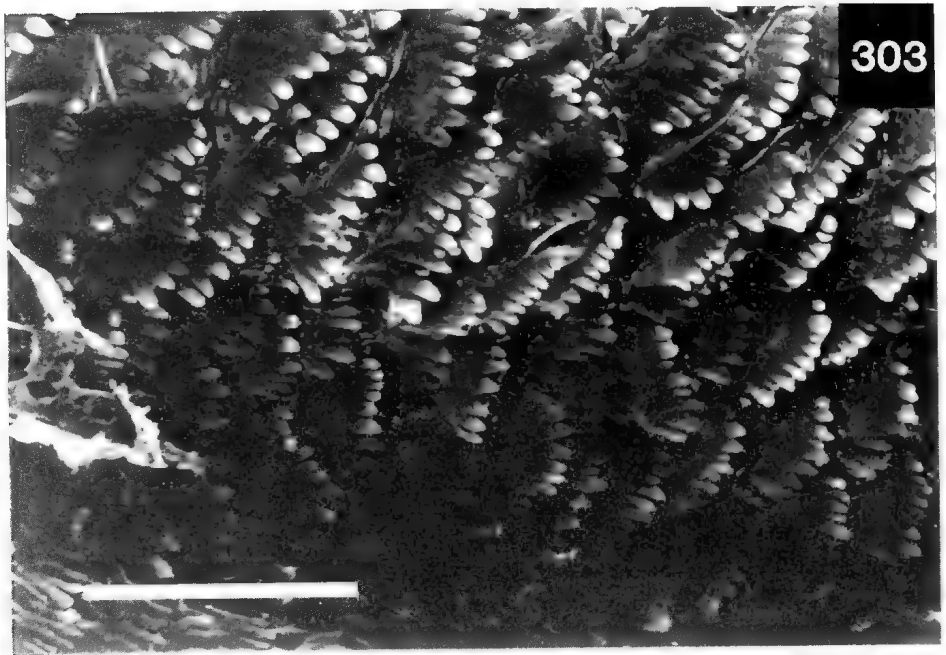
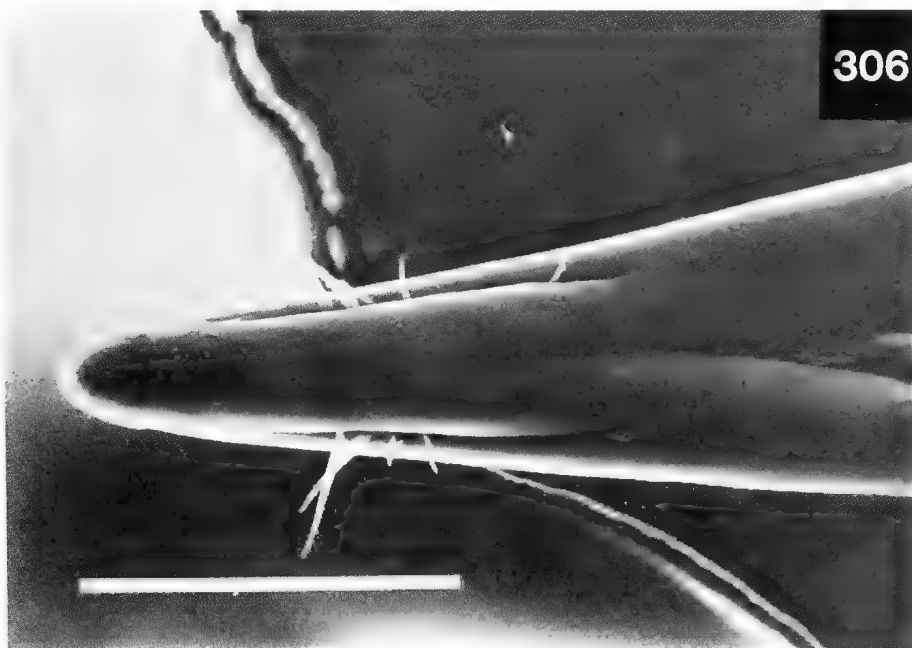
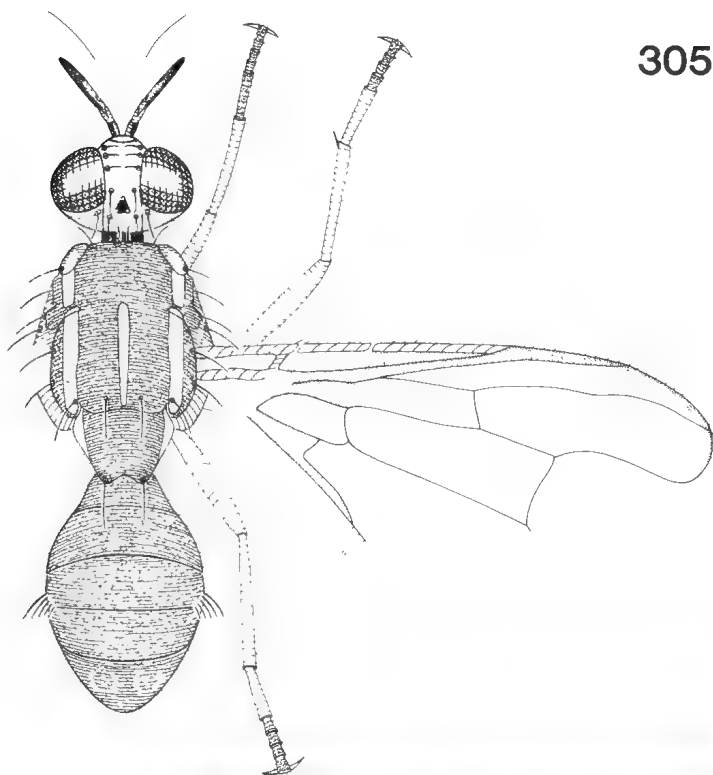


FIG. 303. *Bactrocera (Gymnodacus) calophylli* (Perkins and May), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 304. *Bactrocera (Gymnodacus) petila* n. sp., adult male (x10).



FIGS 305–306. *Bactrocera* (*Notodacus*) *xanthodes* (Broun): 305, adult male (x10); 306, apex of aculeus (scale 0.1 mm).

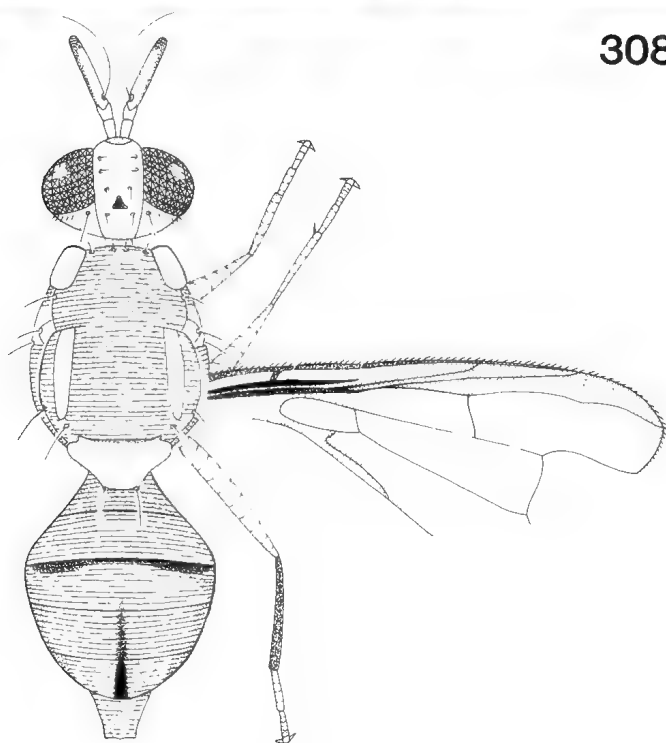
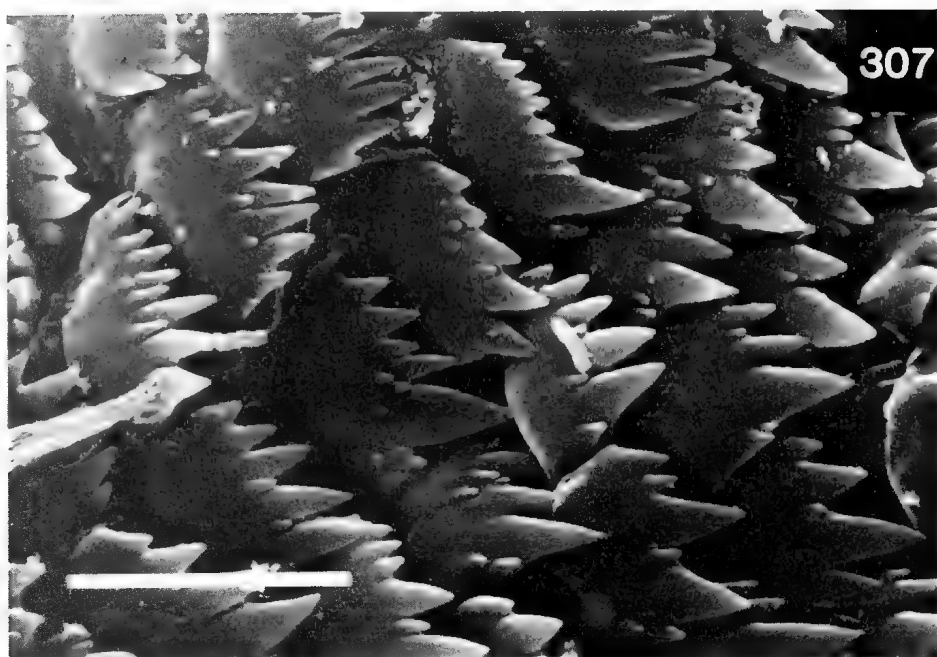
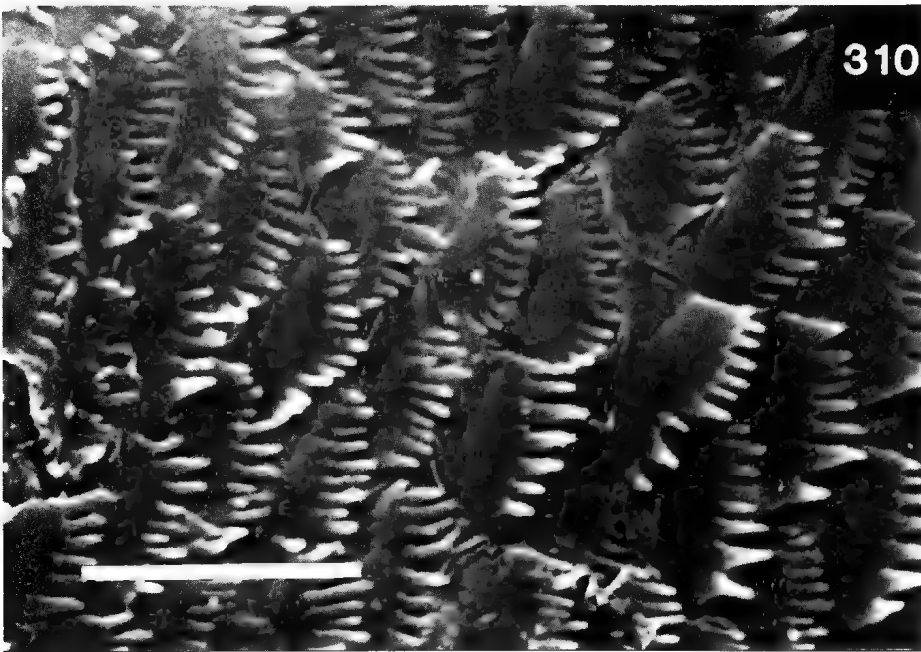
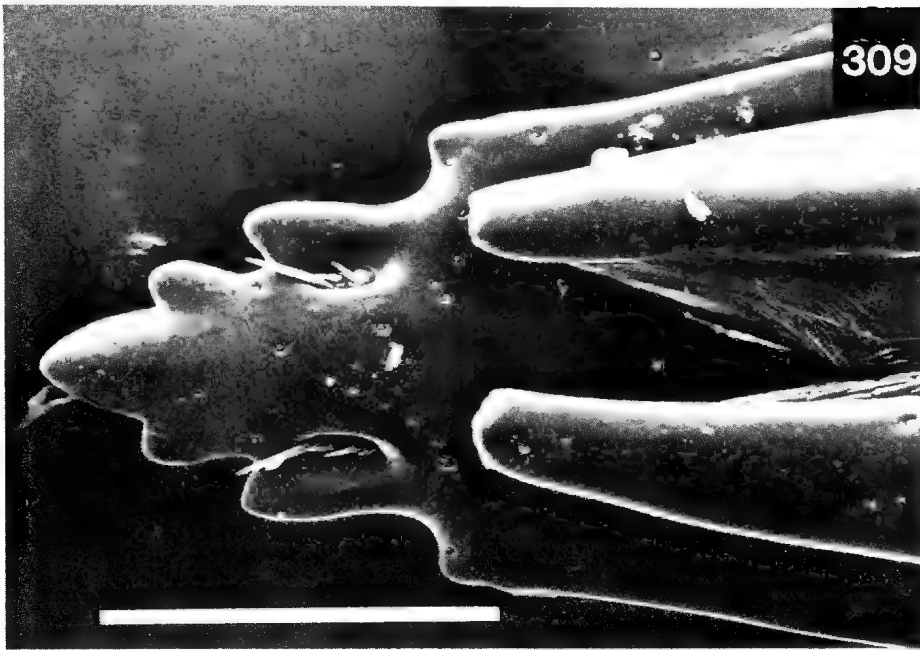
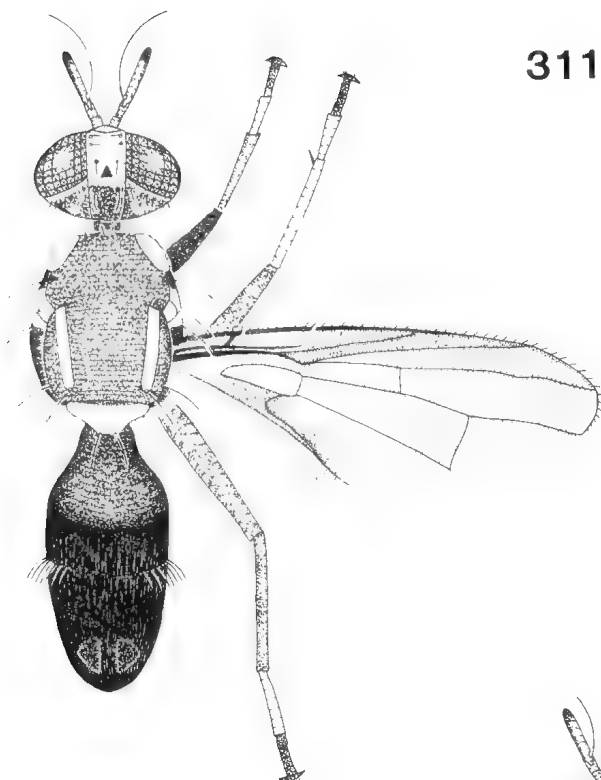


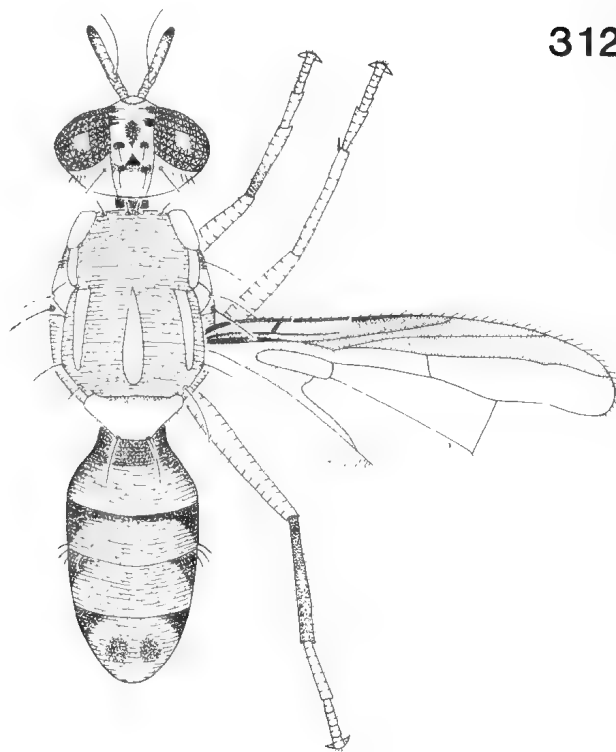
FIG. 307. *Bactrocera (Notodacus) xanthodes* (Broun), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 308. *Bactrocera (Polistomimetes) decurtans* (May), adult female (x10).



FIGS 309–310. *Bactrocera (Polistomimetes) decurtans* (May): 309, apex of aculeus (scale 0.1 mm); 310, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

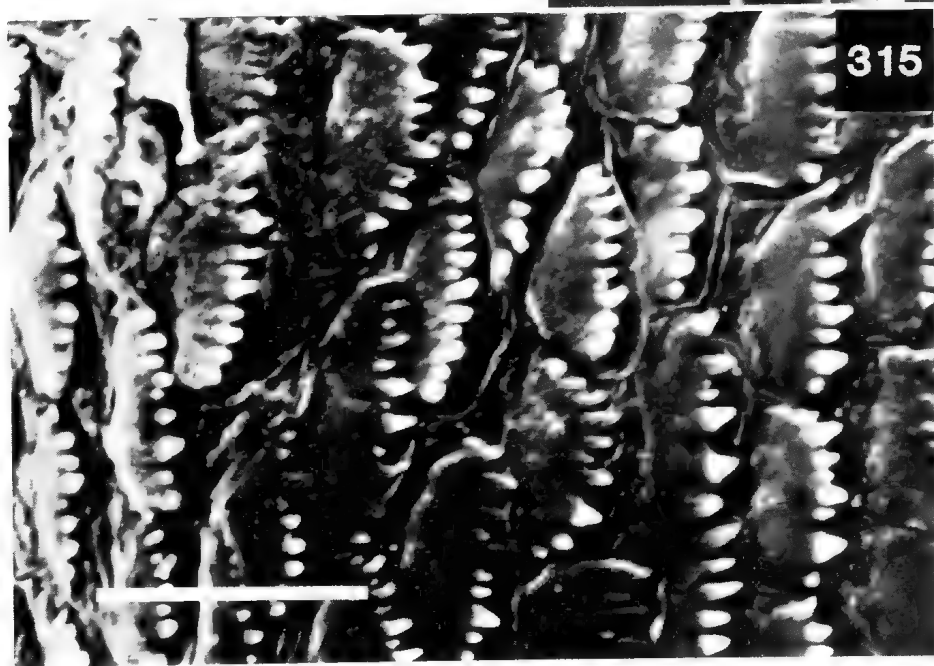
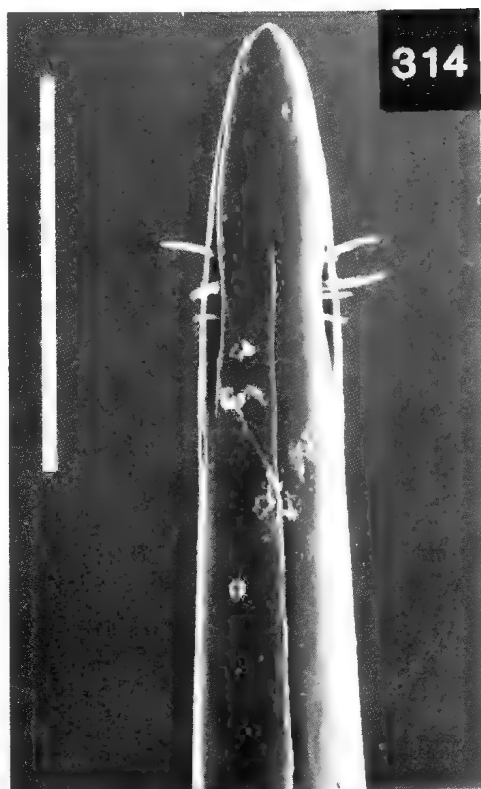
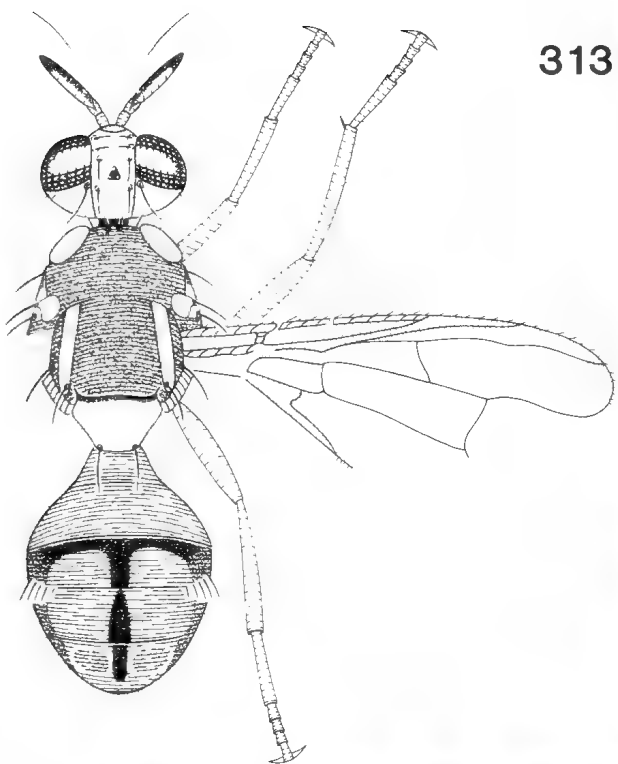


311

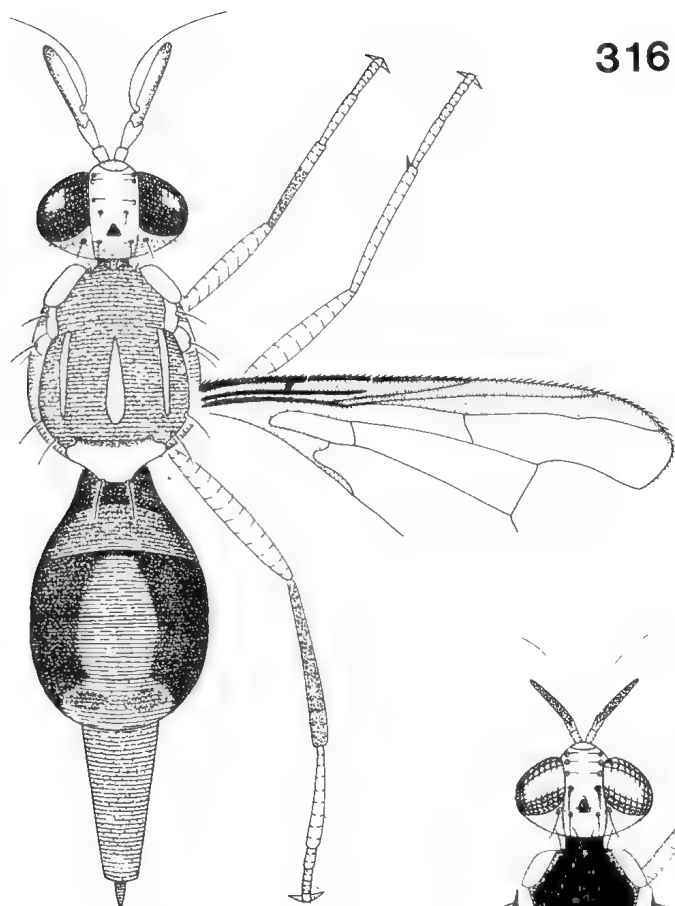


312

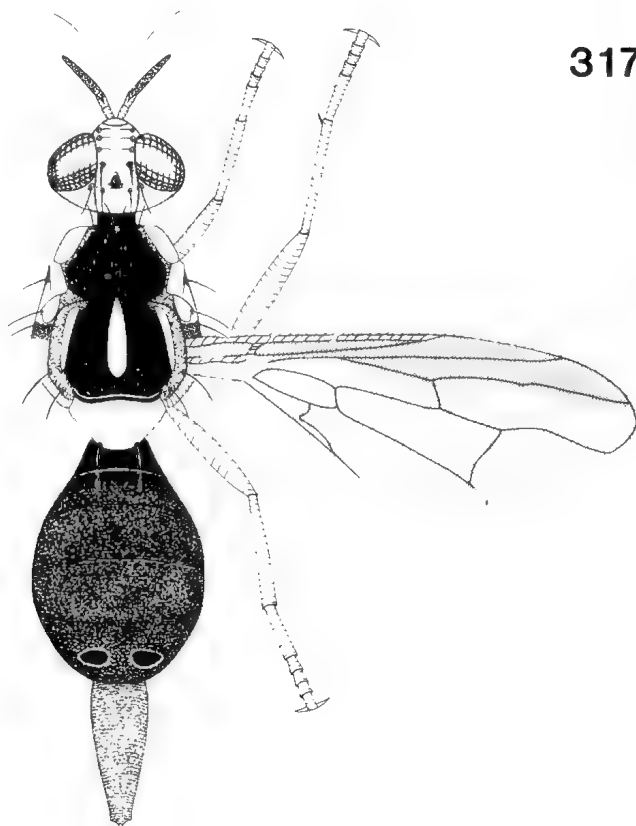
FIG. 311. *Bactrocera* (*Polistomimetes*) *fusalata* n. sp., adult male (x9). FIG. 312. *Bactrocera* (*Polistomimetes*) *mesonotochra* n. sp., adult male (x8).



FIGS 313–315. *Bactrocera (Polistomimetes) murrayi* (Perkins): 313, adult male (x8); 314, apex of aculeus (scale 0.1 mm); 315, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

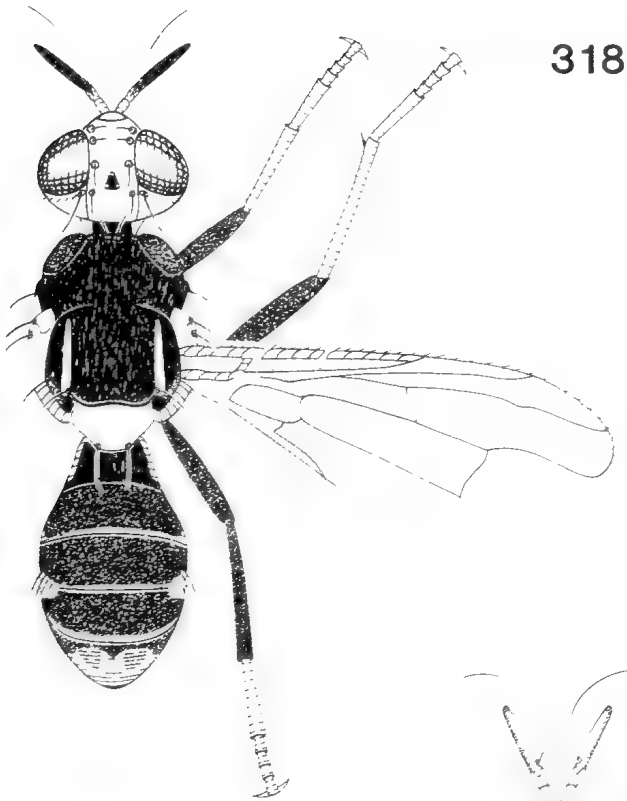


316

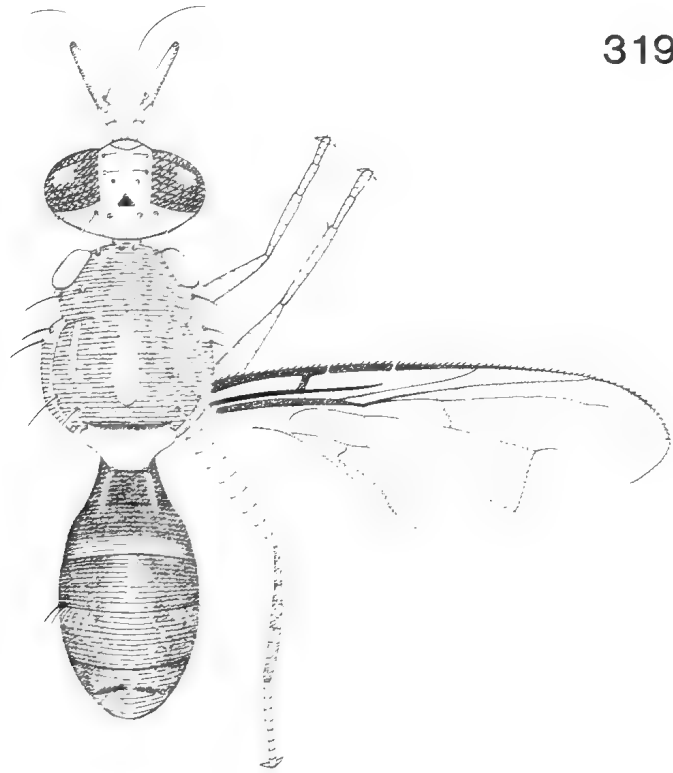


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FIG. 316. *Bactrocera (Polistomimetes) neopagdeni* n. sp., adult female (x9). FIG. 317. *Bactrocera (Polistomimetes) pagdeni* (Malloch), adult female (x8).

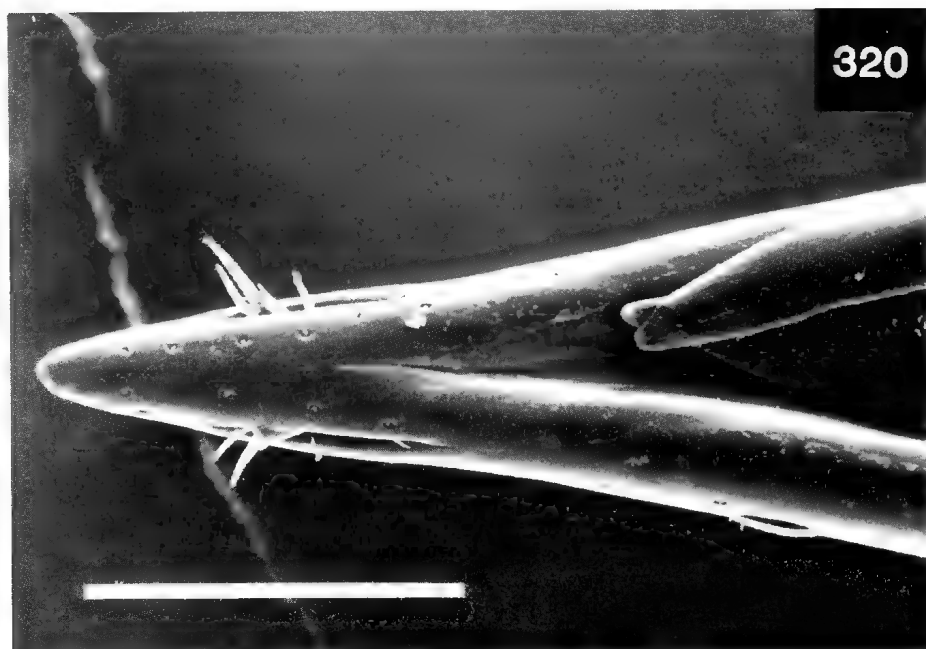


318

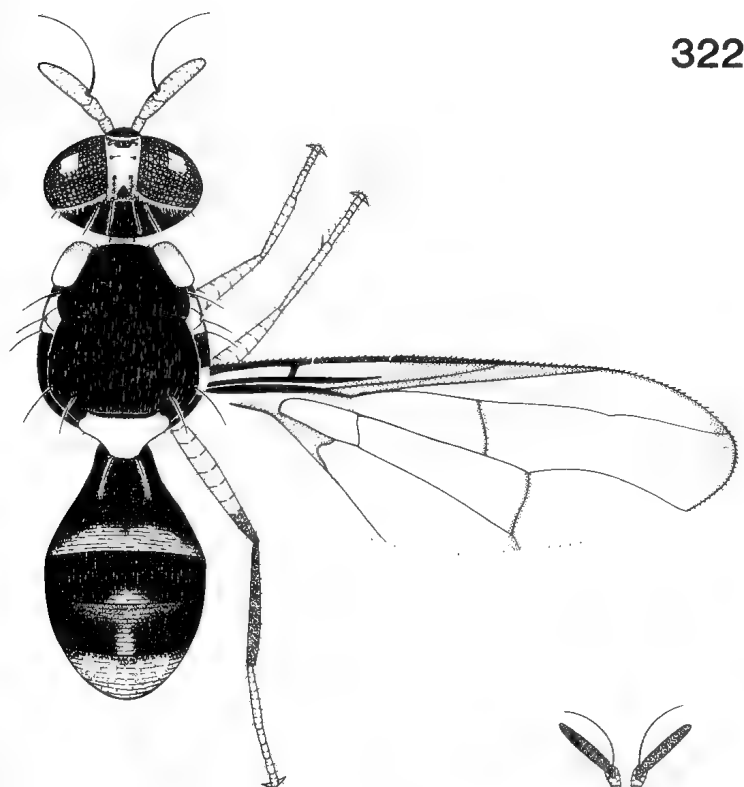


319

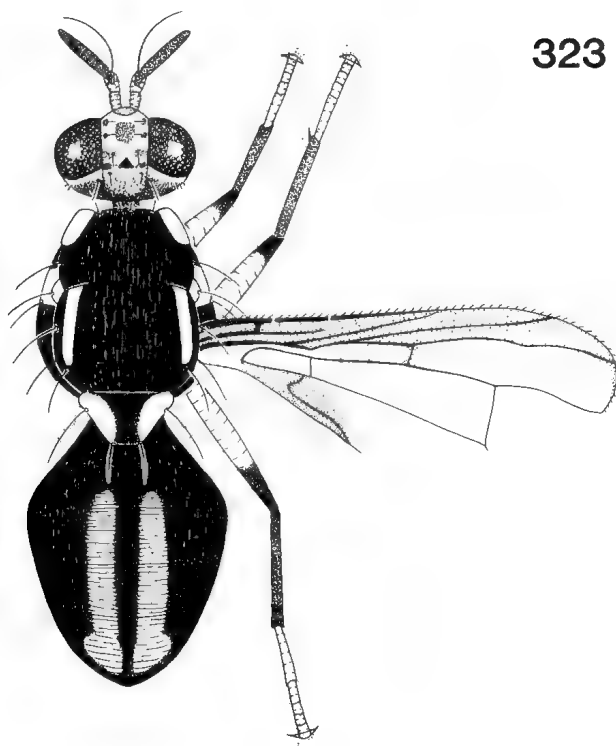
FIG. 318. *Bactrocera (Polistomimetes) toxopeusi* (Hering), adult male (x8). FIG. 319. *Bactrocera (Polistomimetes) visenda* (Hardy), adult male (x10).



FIGS 320–321. *Bactrocera* (*Polistomimetes*) *visenda* (Hardy): 320, apex of aculeus (scale 0.1 mm); 321, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

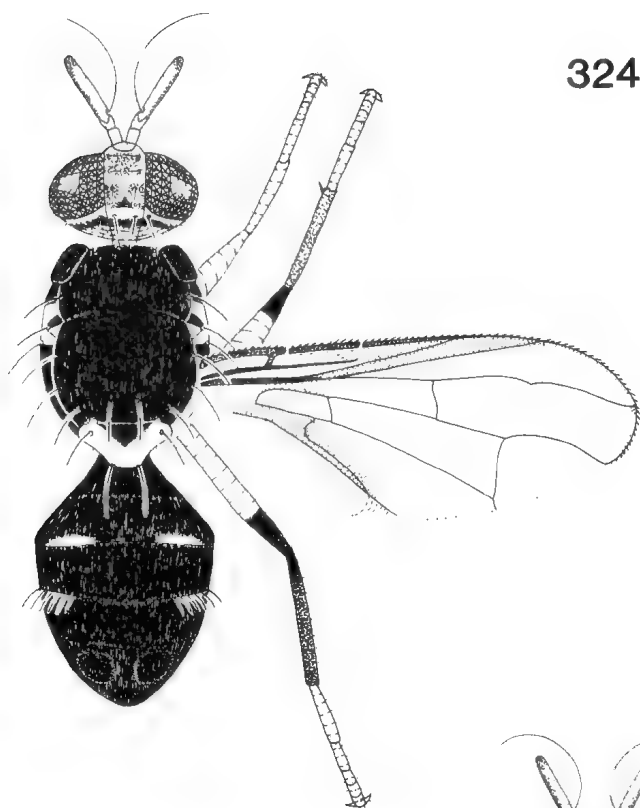


322

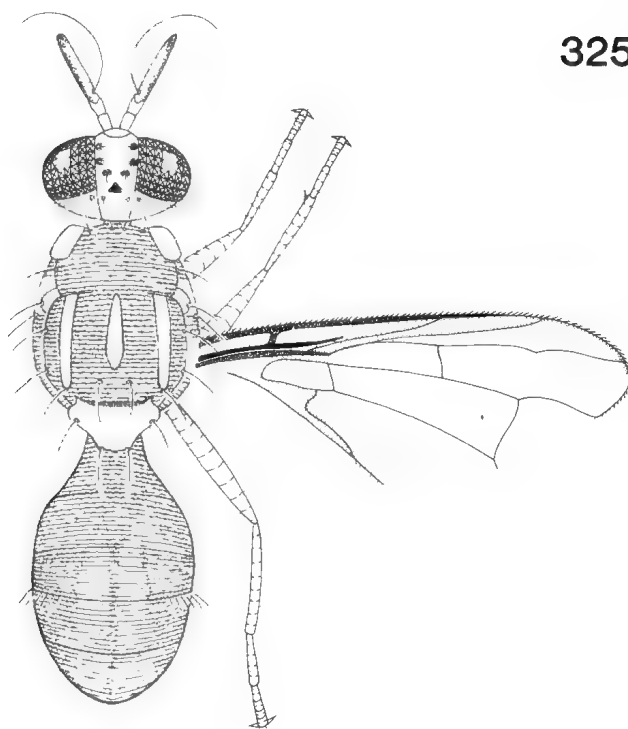


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FIG. 322. *Bactrocera (Trypetidacus) invisitata* n. sp., adult male (x14). FIG. 323. *Bactrocera (Hemisurstylus) melanoscutata* n. sp., adult male (x7).

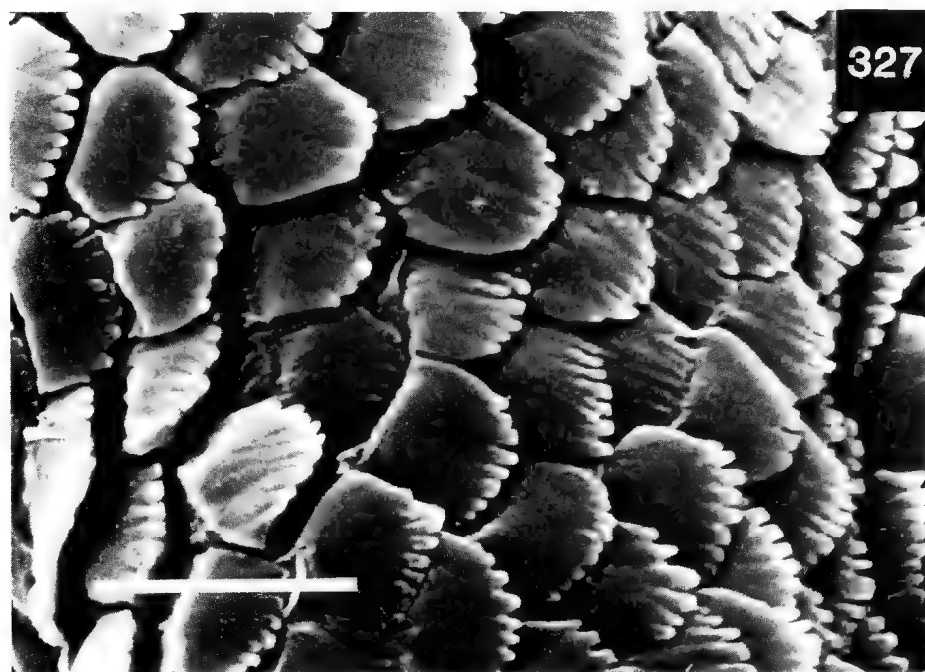
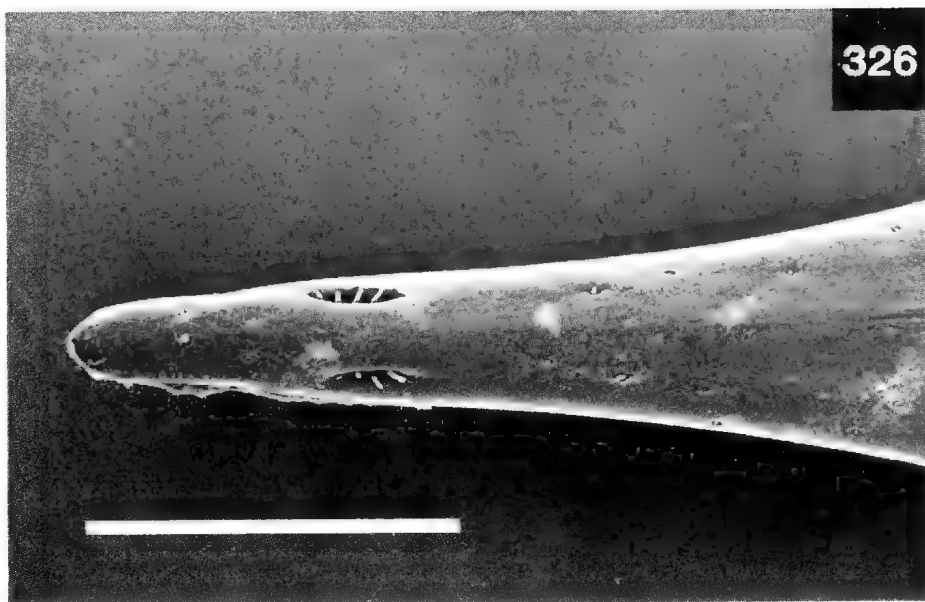


324

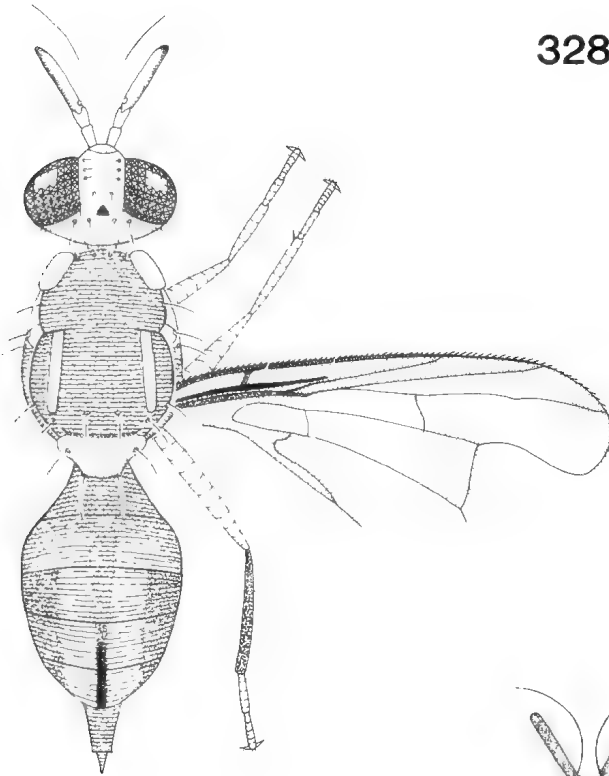


325

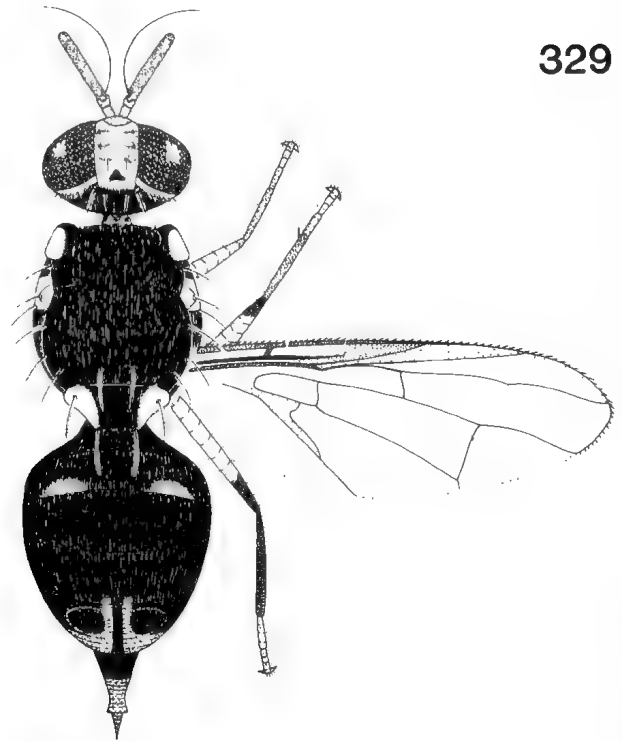
FIG. 324. *Bactrocera* (*Hemizeugodacus*) *abdomininigra* n. sp., adult male (x10). FIG. 325. *Bactrocera* (*Hemizeugodacus*) *aglaiae* (Hardy), adult male (x8).



FIGS 326–327. *Bactrocera* (*Hemizeugodacus*) *aglaiae* (Hardy): 326, apex of aculeus (scale 0.1 mm); 327, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

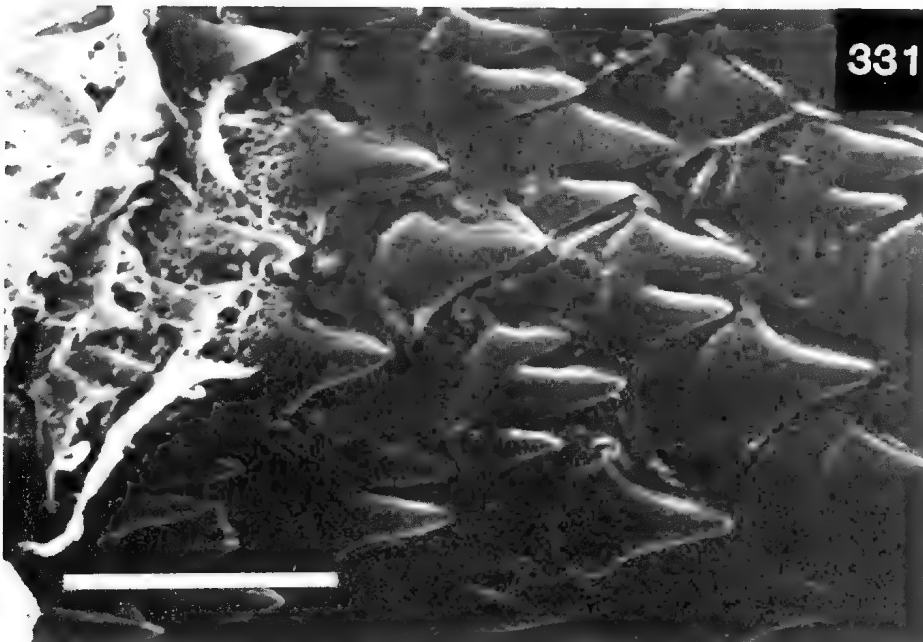
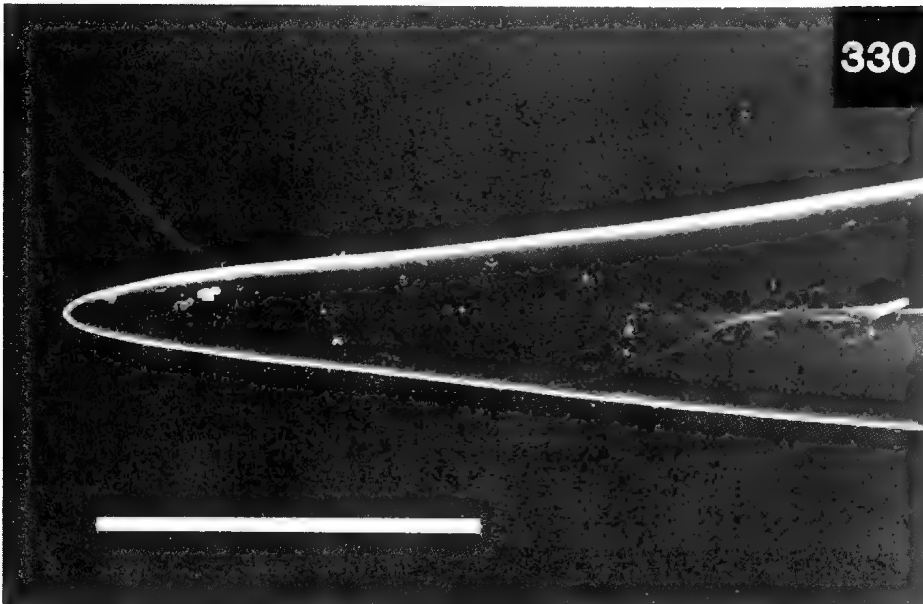


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FIG. 328. *Bactrocera* (*Hemizeugodacus*) *aurea* (May), adult female (x10). FIG. 329. *Bactrocera* (*Melanodacus*) *nigra* (Tryon), adult female (x11).



FIGS 330–331. *Bactrocera (Melanodacus) nigra* (Tryon): 330, apex of aculeus (scale 0.1 mm); 331, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

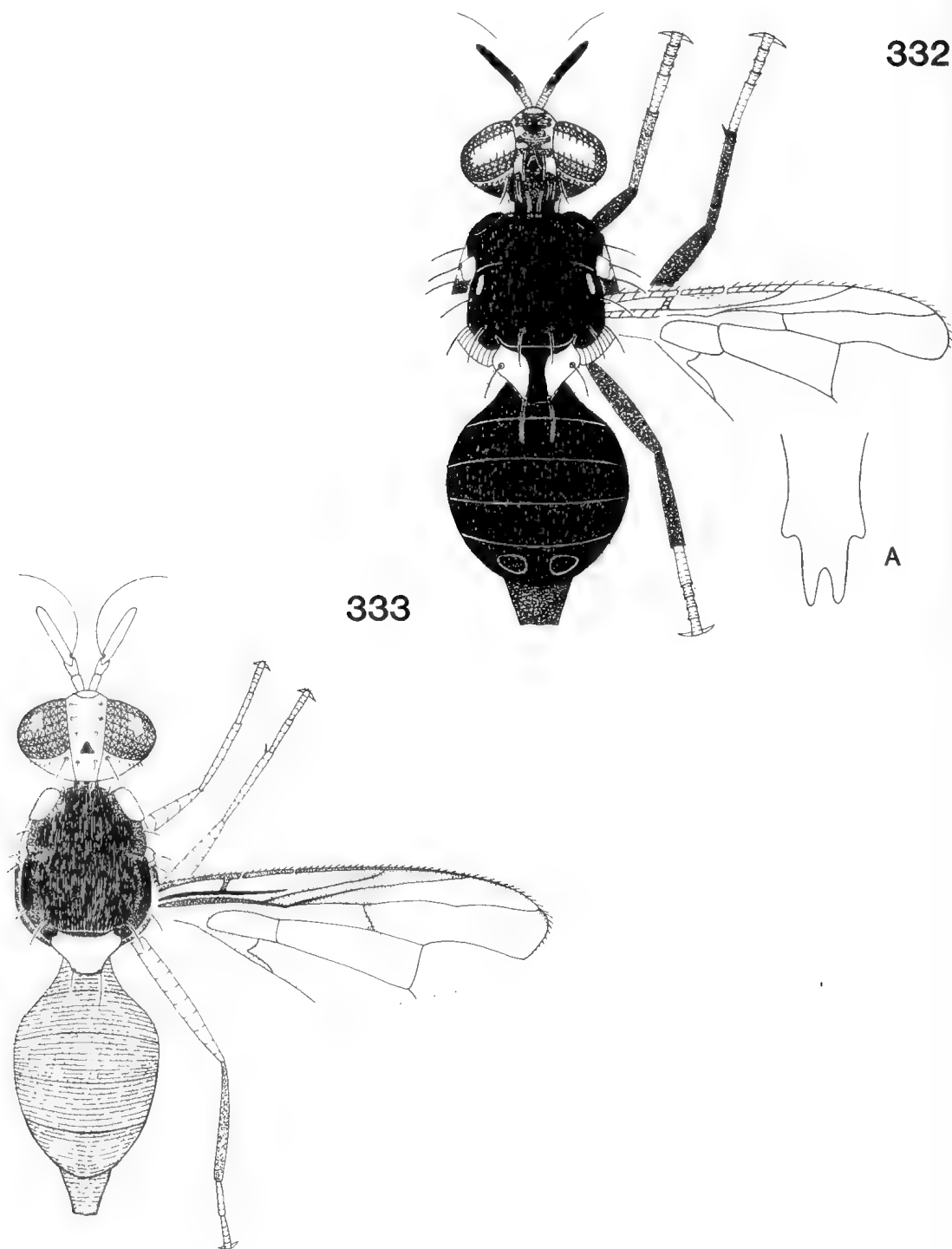
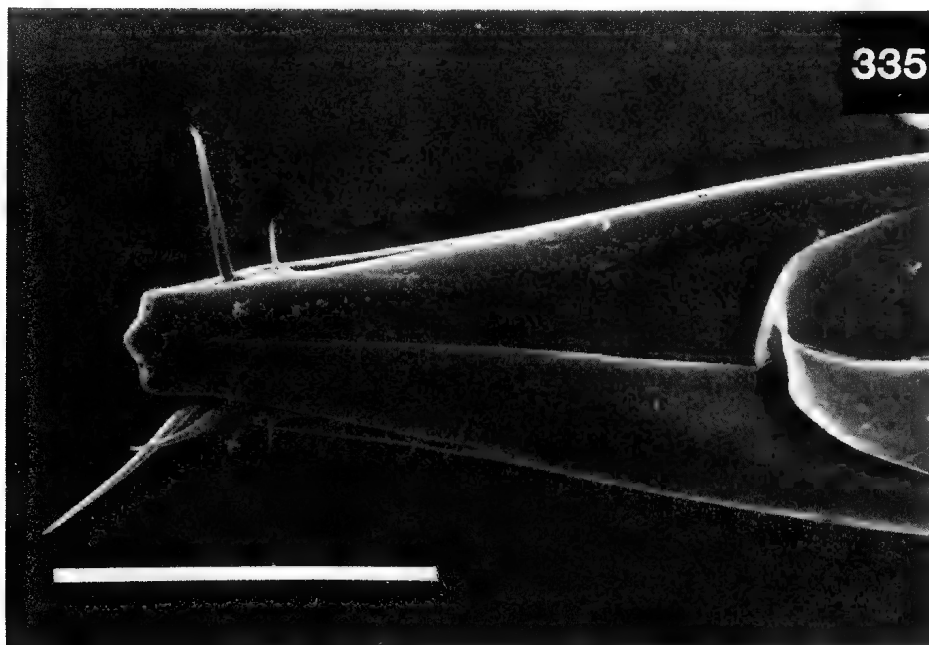
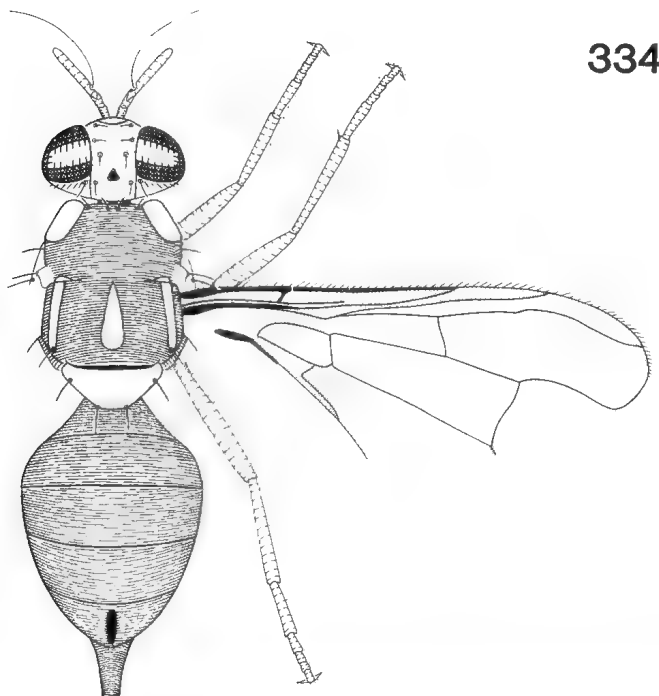


FIG. 332. *Bactrocera* (*Melanodacus*) *satanellus* (Hering), adult female (x14). A, apex of aculeus. FIG. 333. *Bactrocera* (*Queenslandacus*) *exigua* (May), adult female (x11).



FIGS 334–335. *Bactrocera* (*Austrodacus*) *cucumis* (French): 334, adult female (x11); 335, apex of aculeus (scale 0.1 mm).

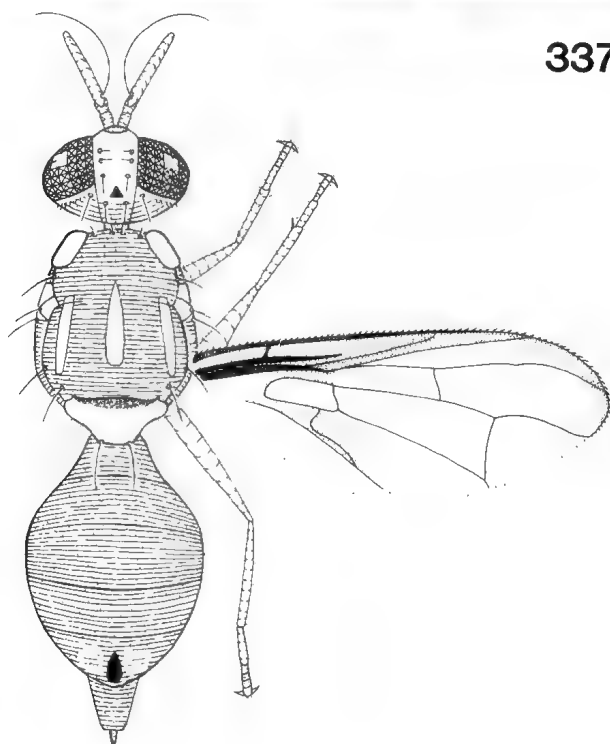
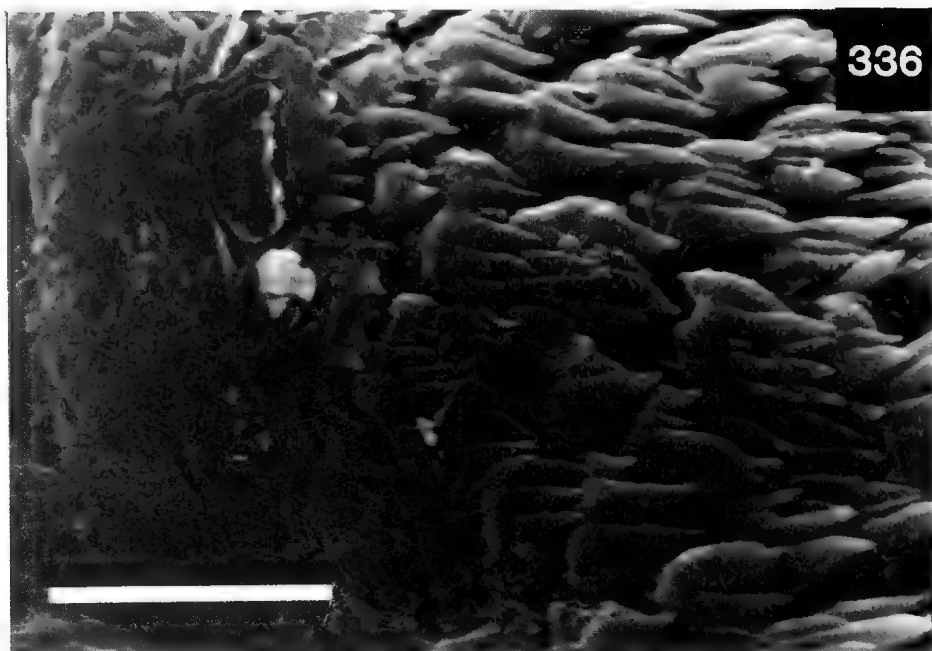
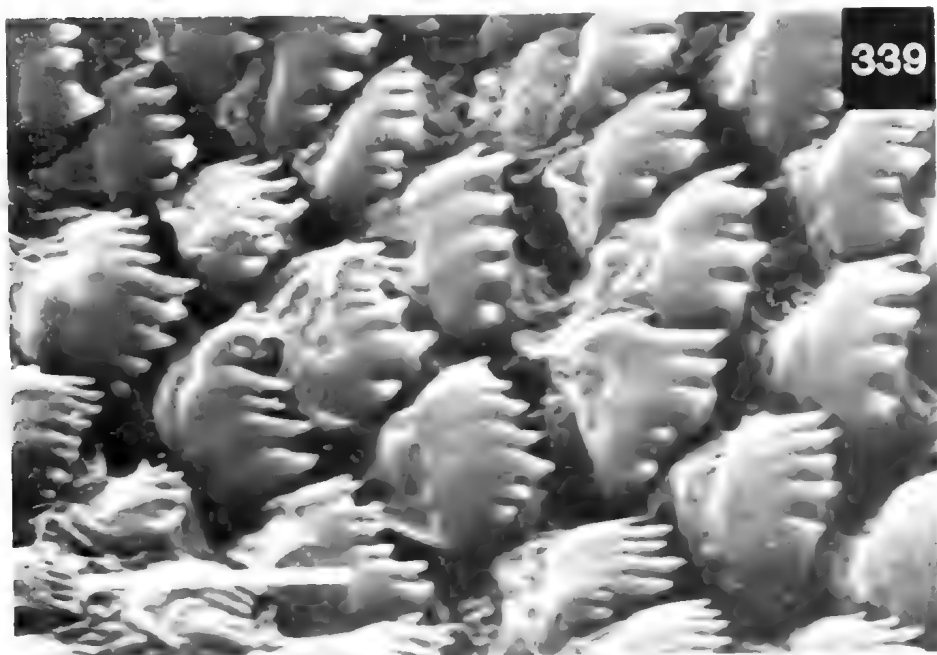
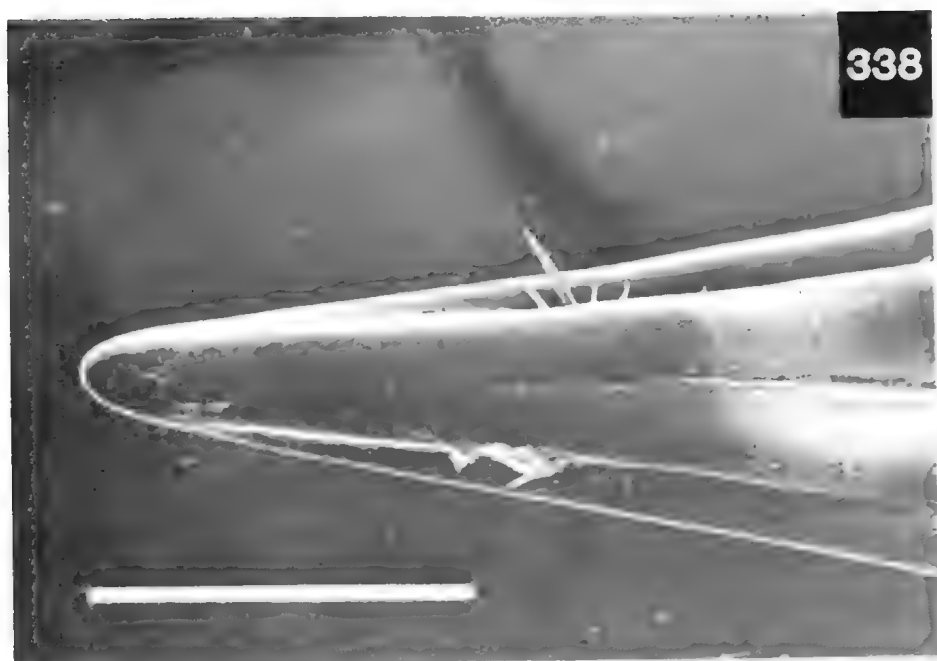


FIG. 336. *Bactrocera (Austrodacus) cucumis* (French), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 337. *Bactrocera (Diplodacus) signatifera* (Tryon), adult female (x10).



FIGS 338–339. *Bactrocera (Diplodacus) signatifera* (Tryon): 338, apex of aculeus (scale 0.1 mm); 339, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

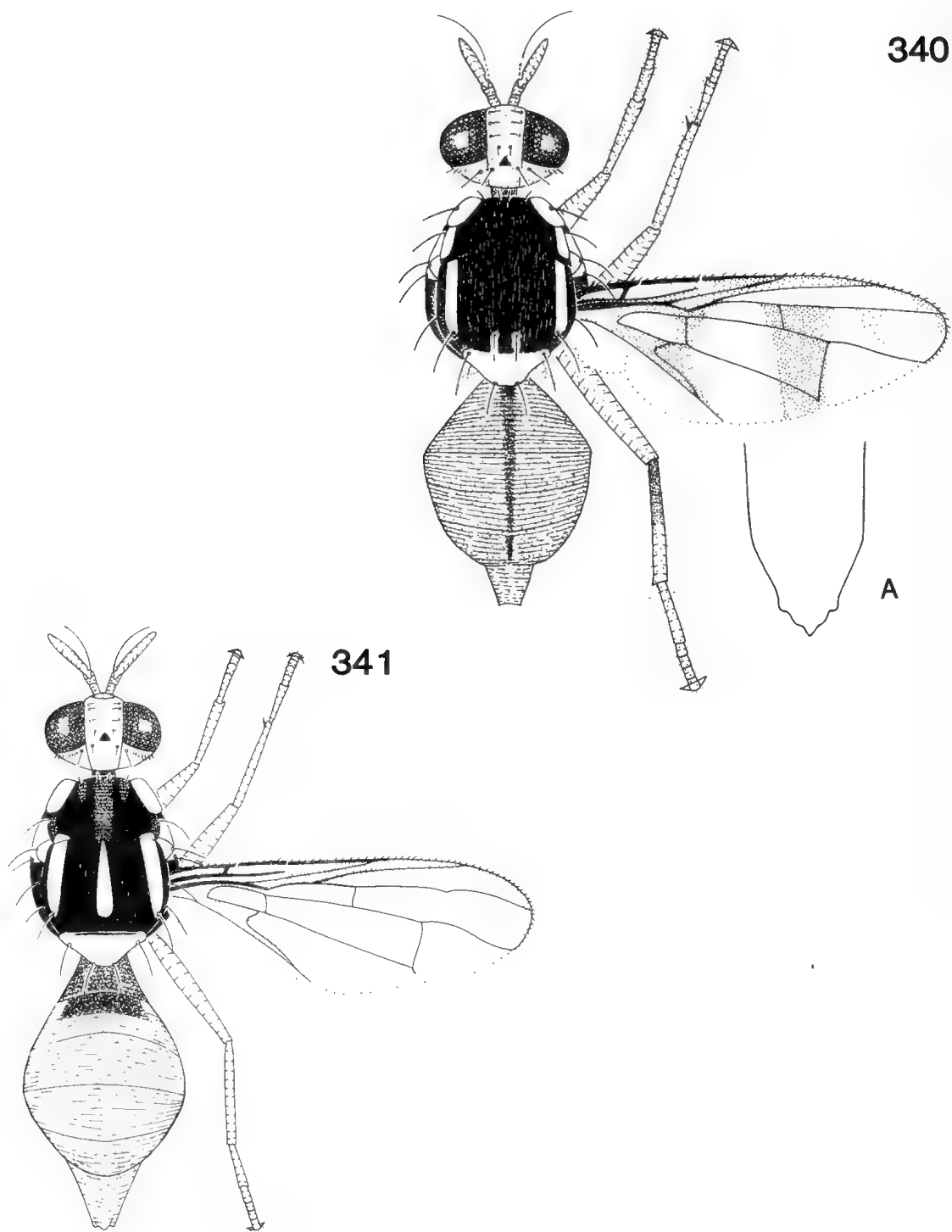
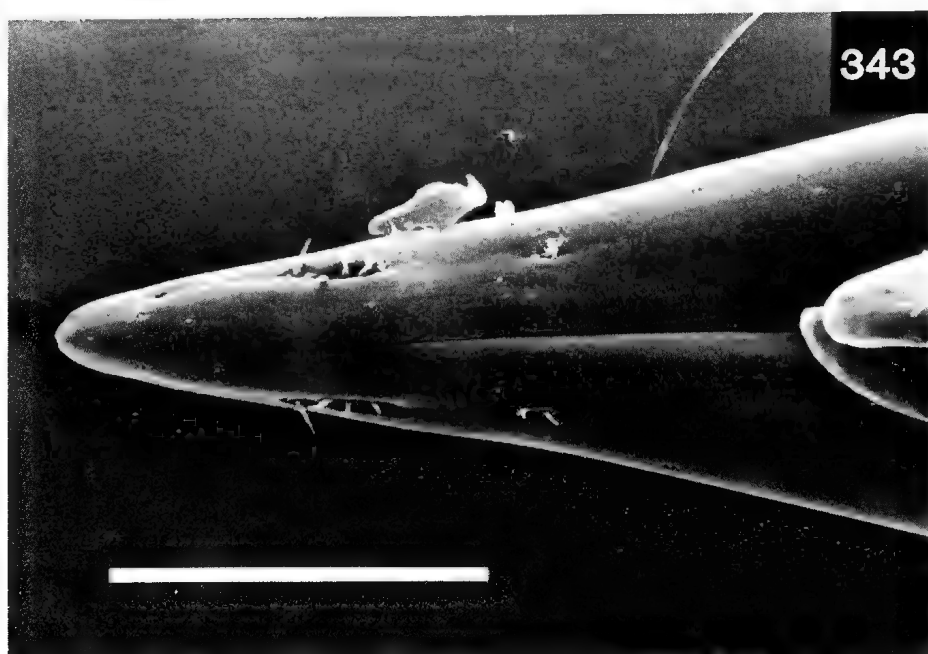
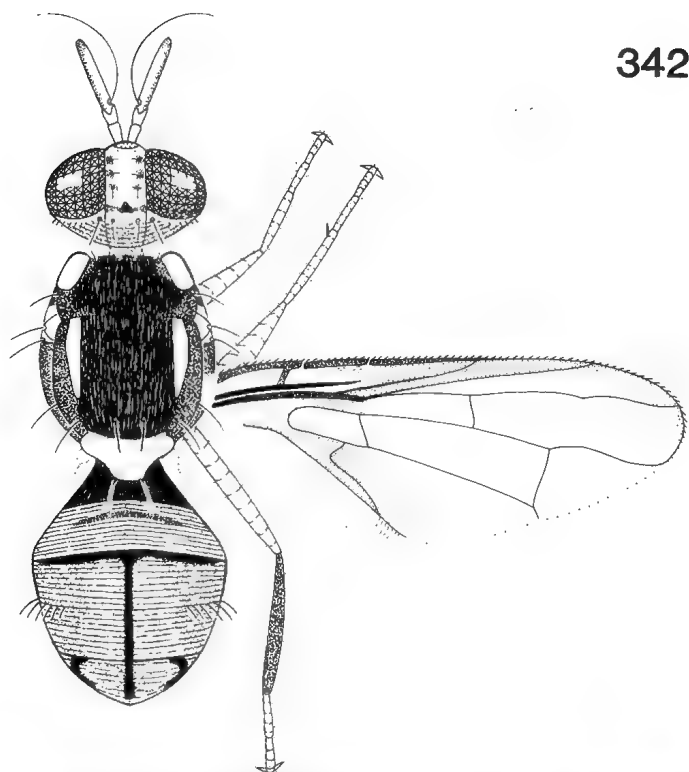


FIG. 340. *Bactrocera (Heminotodacus) dissidens* n. sp., adult female (x11). A, apex of aculeus. FIG. 341. *Bactrocera (Hemiparatriidacus) abdoaurantiaca* n. sp., adult female (x8).



FIGS 342–343. *Bactrocera (Javadacus) aberrans* (Hardy): 342, adult male (x12); 343, apex of aculeus (scale 0.1 mm).

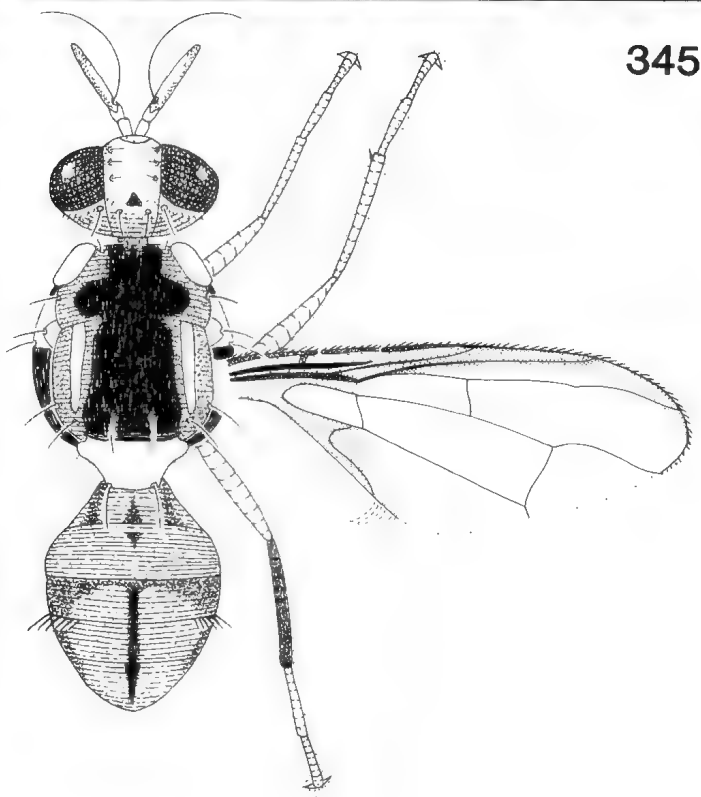
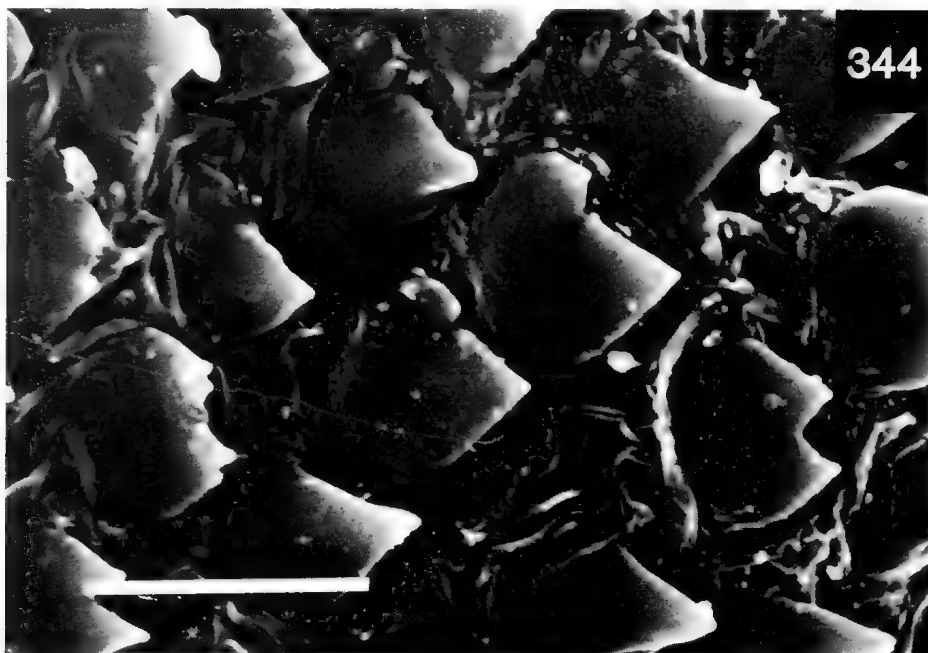
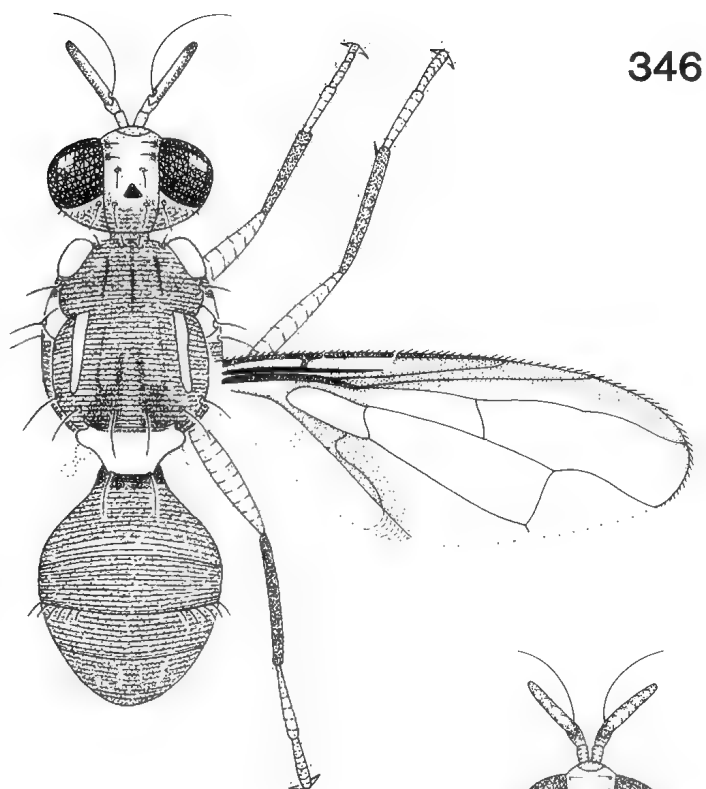
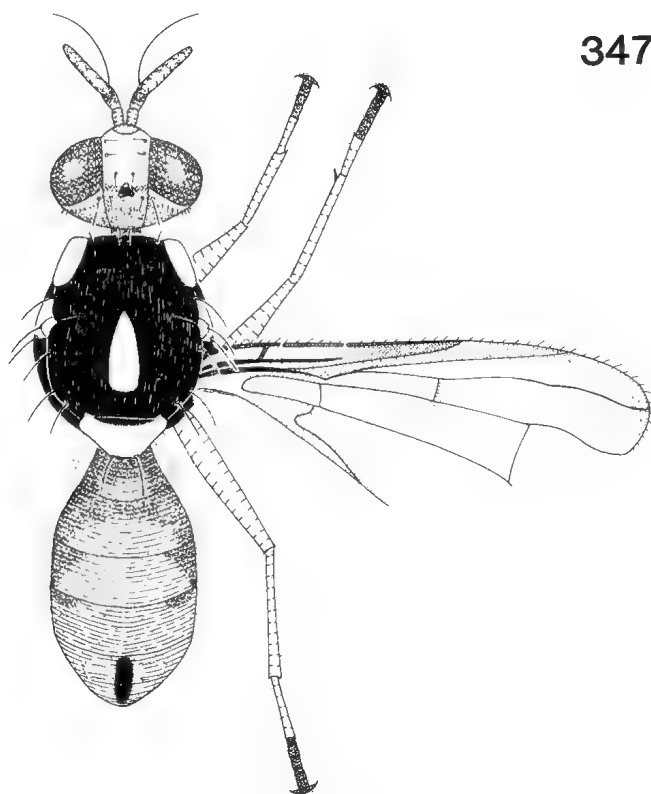


FIG. 344. *Bactrocera (Javadacus) aberrans* (Hardy), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 345. *Bactrocera (Javadacus) melanothoracica* n. sp., adult male (x11).

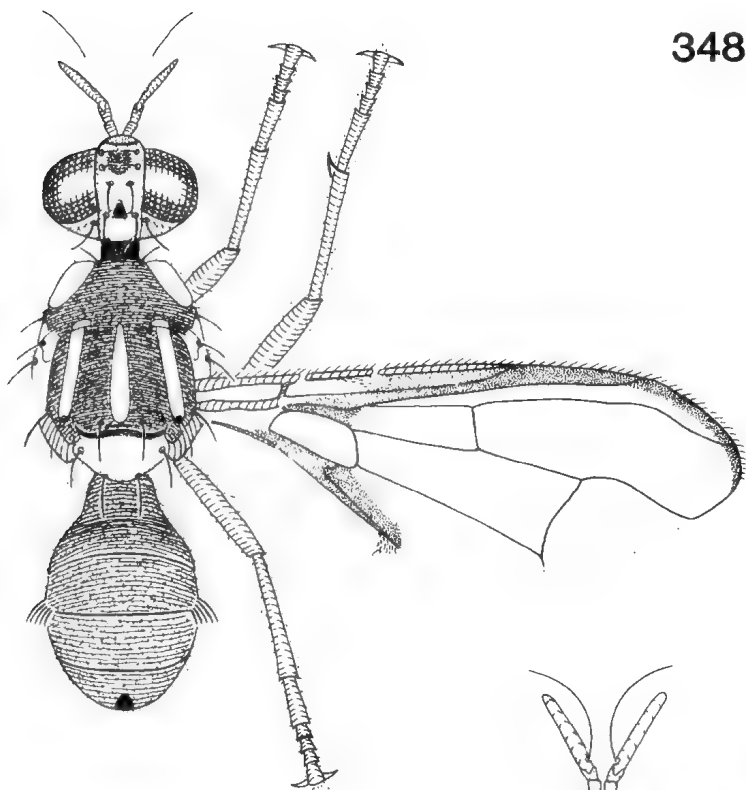


346

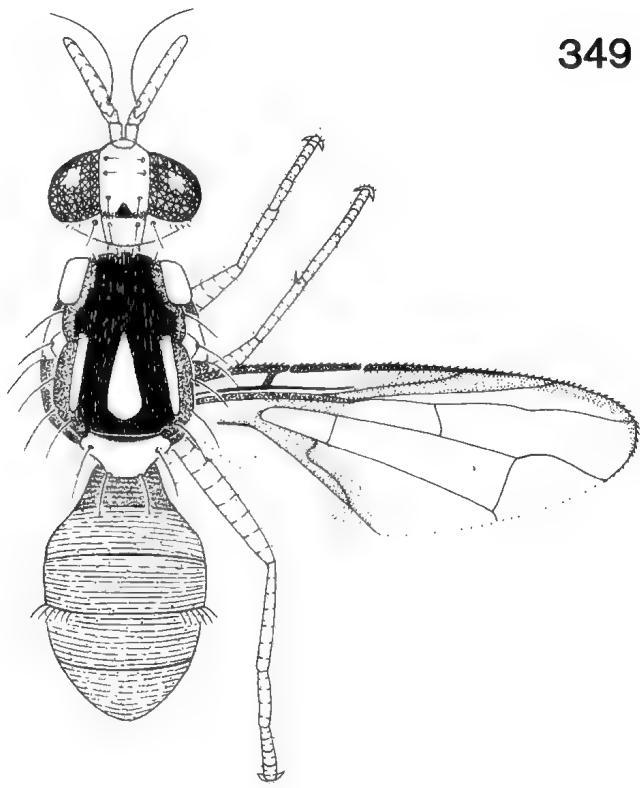


347

FIG. 346. *Bactrocera (Javadacus) unirufa* n. sp., adult male (x11). FIG. 347. *Bactrocera (Niuginidacus) singularis* n. sp., adult male (x11).

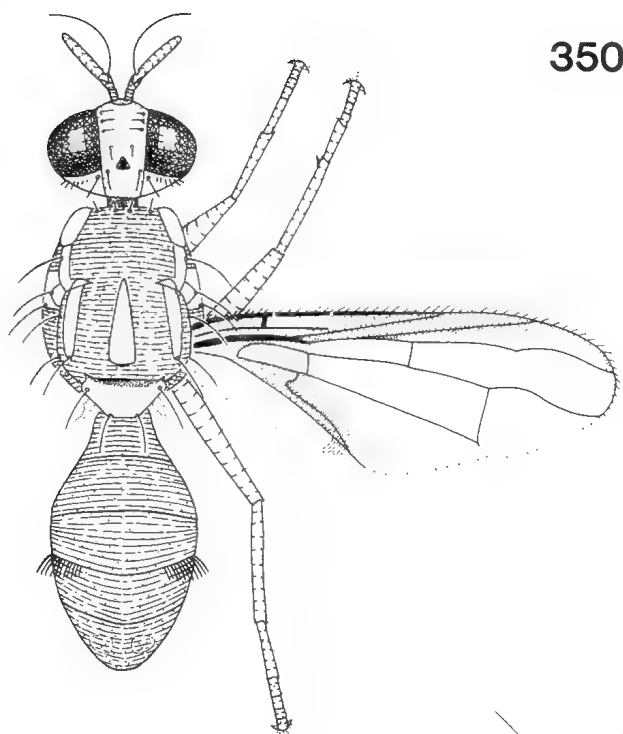


348

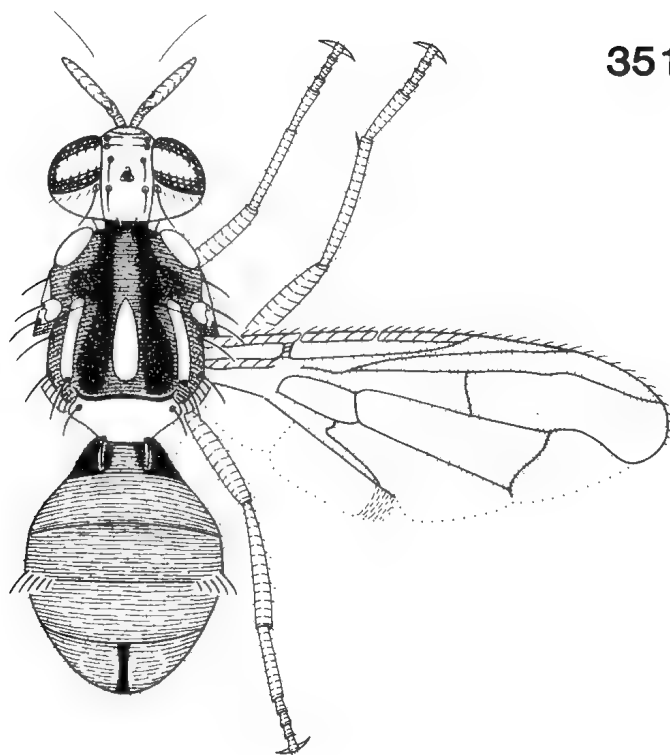


349

FIG. 348. *Bactrocera* (*Papuodacus*) *neopallescens* n. nom., adult male (x12). FIG. 349. *Bactrocera* (*Paradacus*) *aurantiventer* n. sp., adult male (x10).

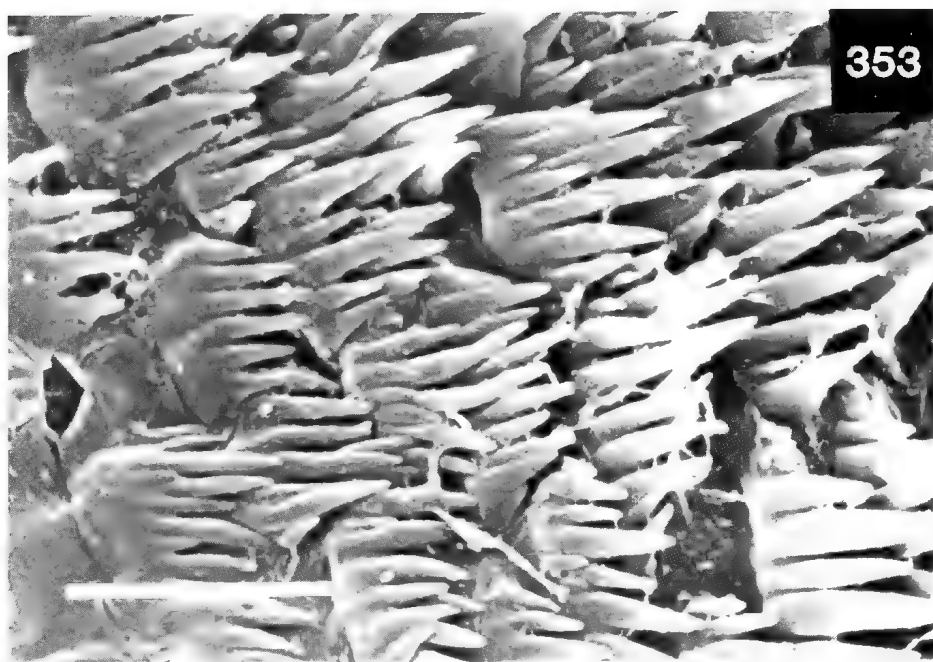
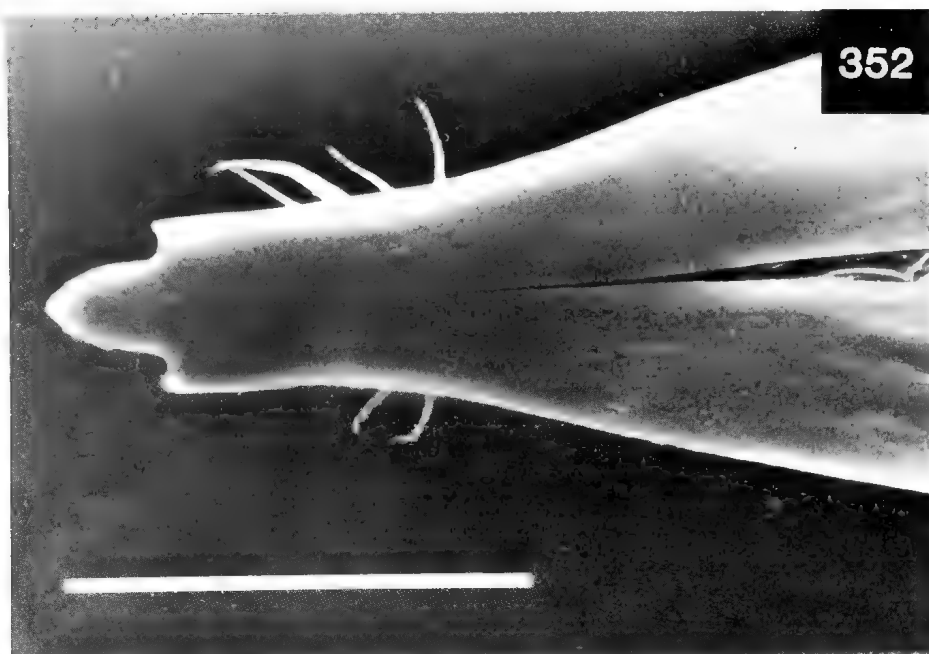


350



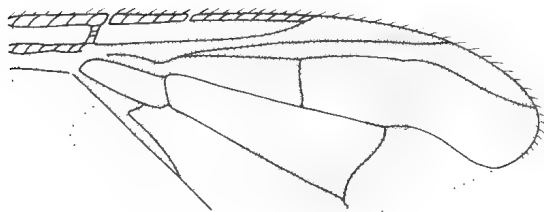
351

FIG. 350. *Bactrocera* (*Paradacus*) *citroides* n. sp., adult male (x9). FIG. 351. *Bactrocera* (*Paradacus*) *decipiens* (Drew), adult male (x7).



FIGS 352–353. *Bactrocera* (*Paradacus*) *decipiens* (Drew): 352, apex of aculeus (scale 0.1 mm); 353, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

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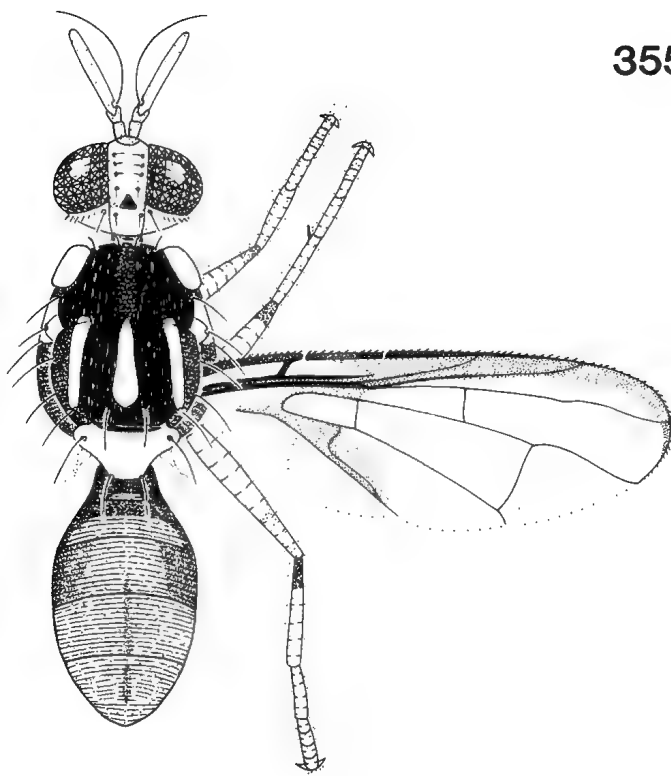
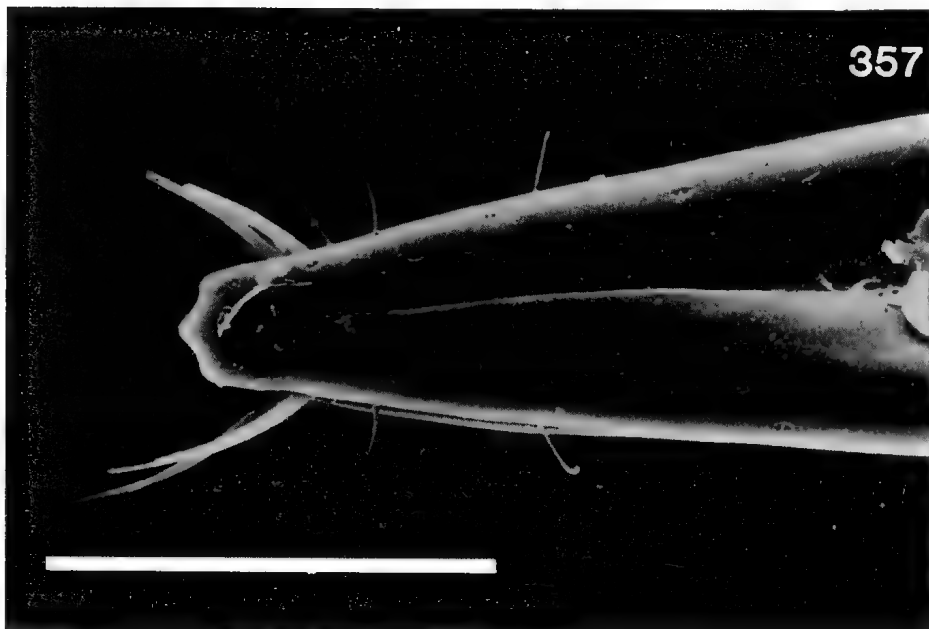
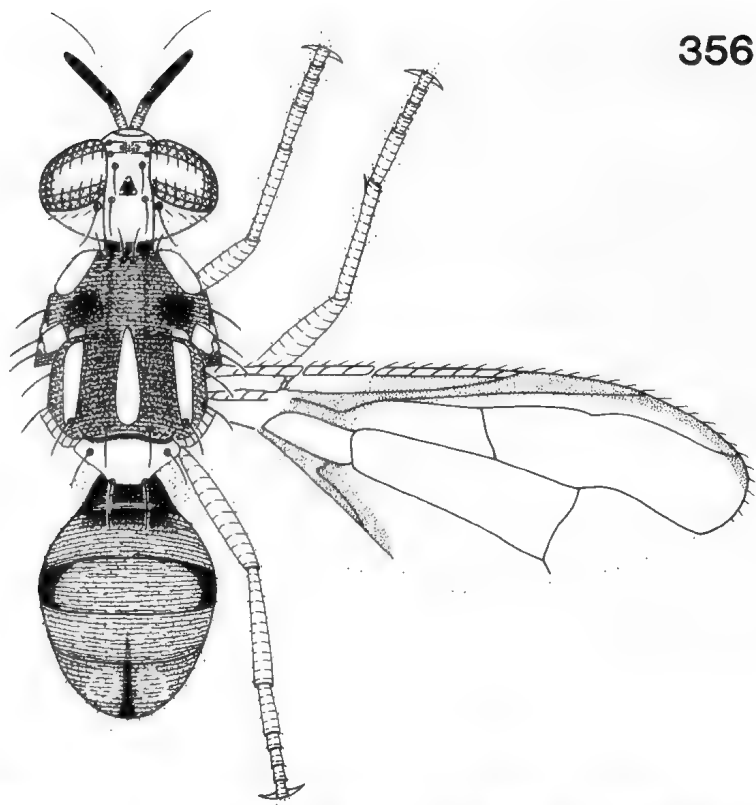


FIG. 354. *Bactrocera* (*Paradacus*) *perplexa* (Walker), wing (x8). FIG. 355. *Bactrocera* (*Paratridacus*) *alampeta* n. sp., adult male (x9).



FIGS 356–357. *Bactrocera* (*Paratridacus*) *atrisetosa* (Perkins): 356, adult male (x11); 357, apex of aculeus (scale 0.1 mm).

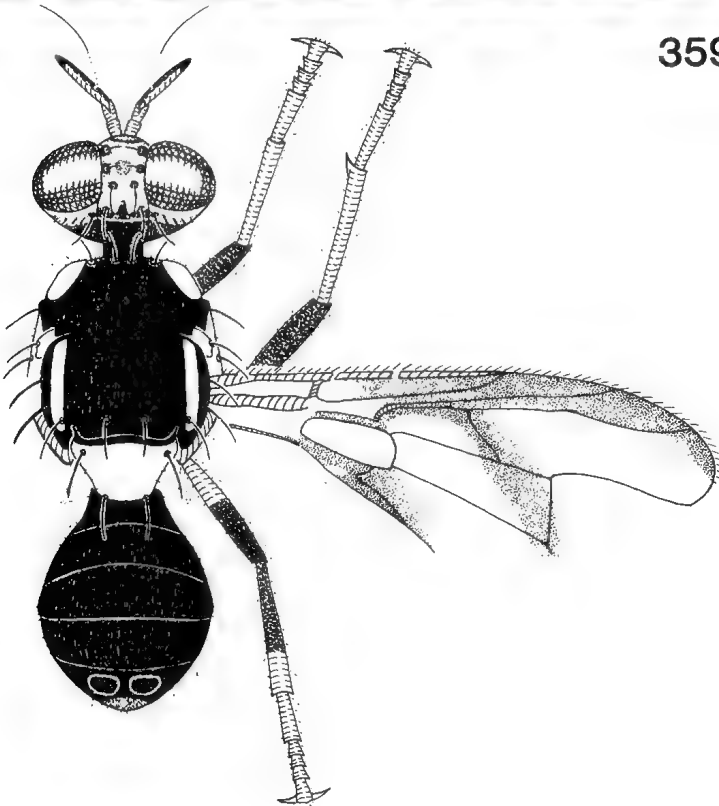
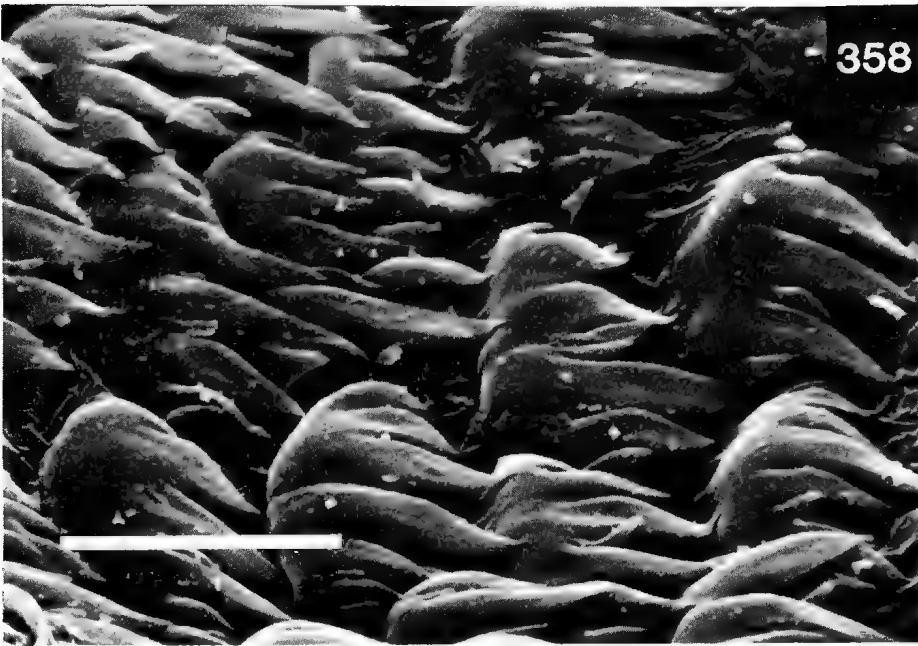
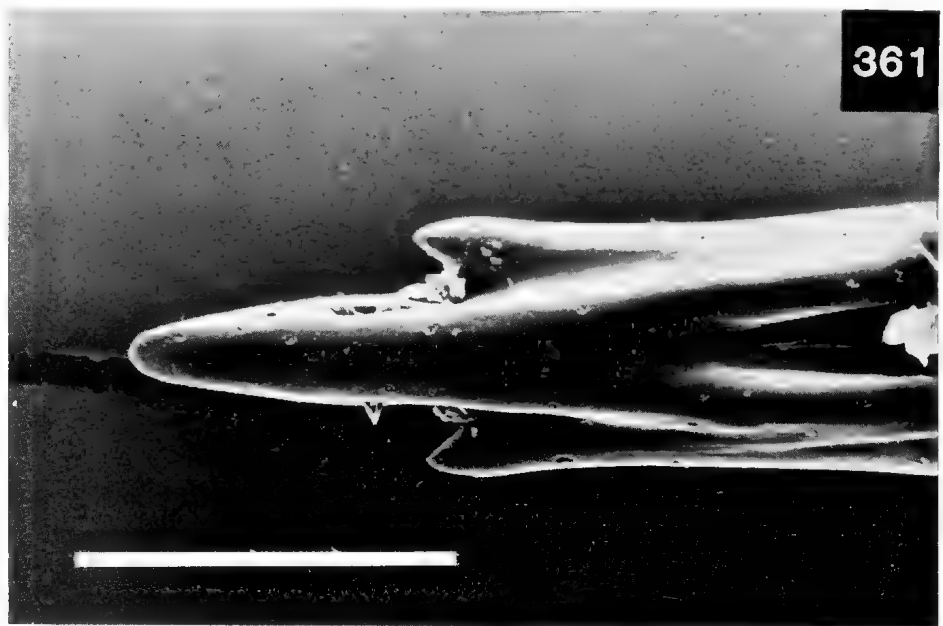
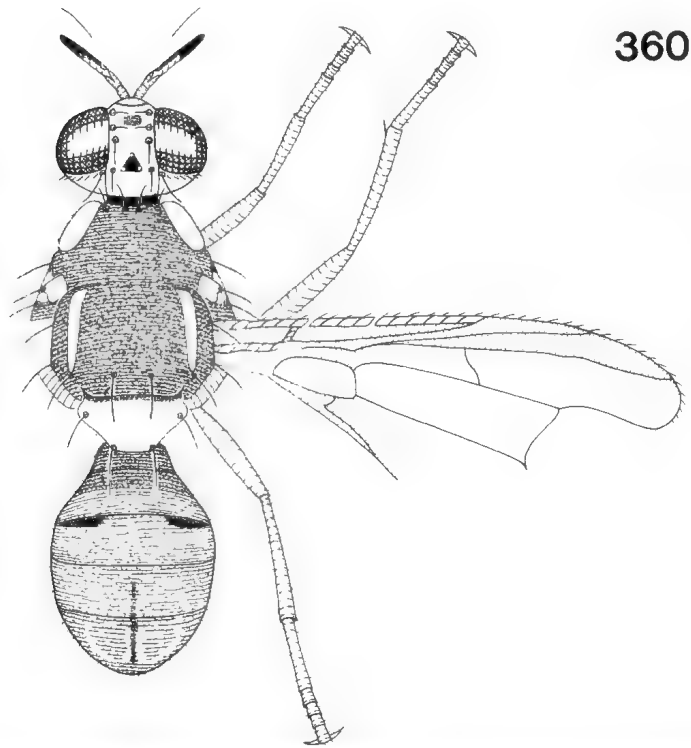


FIG. 358. *Bactrocera* (*Paratridacus*) *atrisetosa* (Perkins), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 359. *Bactrocera* (*Paratridacus*) *coracinus* (Drew), adult male (x13).



FIGS 360–361. *Bactrocera* (*Paratridacus*) *expandens* (Walker): 360, adult male (x7); 361, apex of aculeus (scale 0.1 mm).

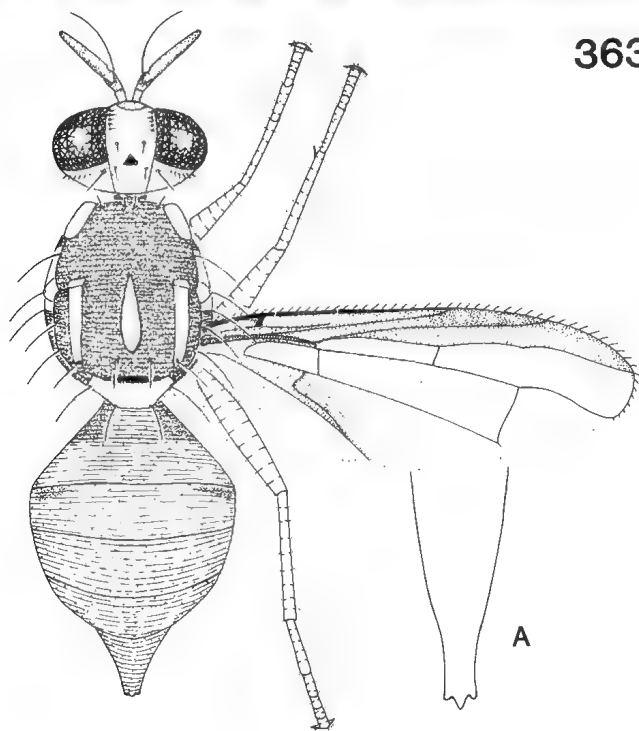
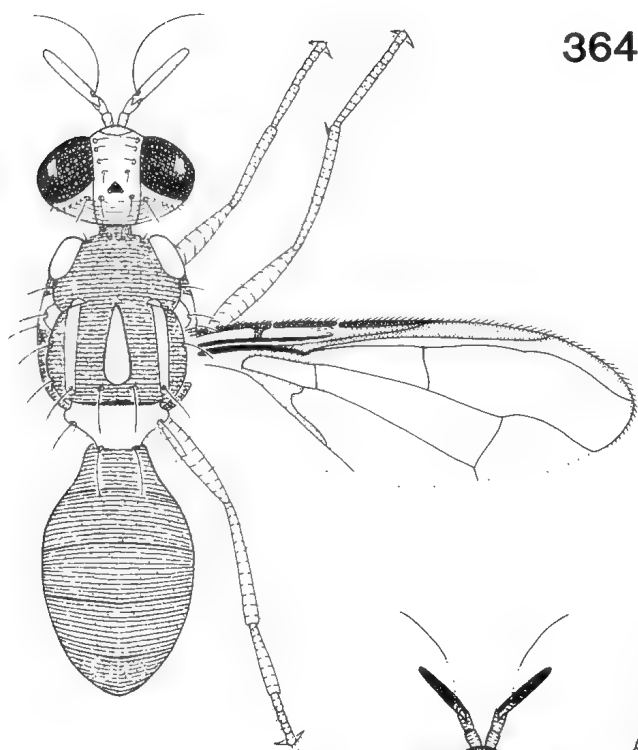
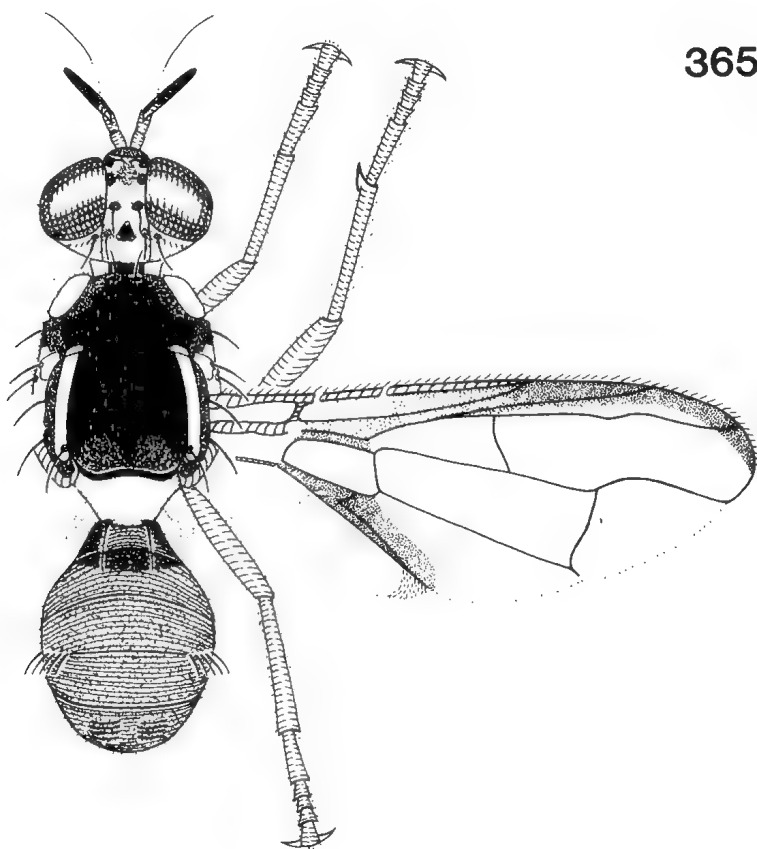


FIG. 362. *Bactrocera* (*Paratridacus*) *expandens* (Walker), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 363. *Bactrocera* (*Paratridacus*) *mesonotaiha* n. sp., adult female (x6). A, apex of aculeus.

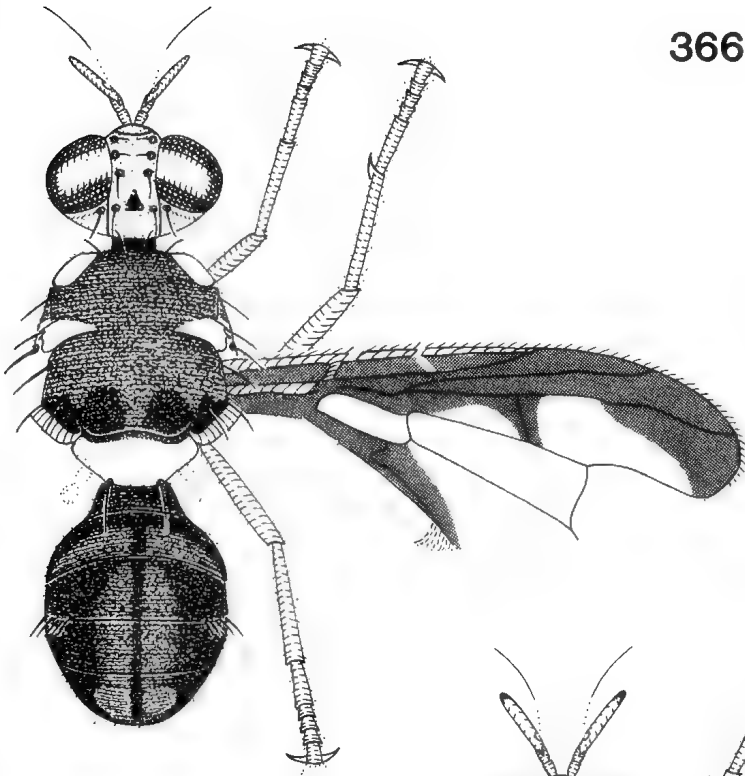


364

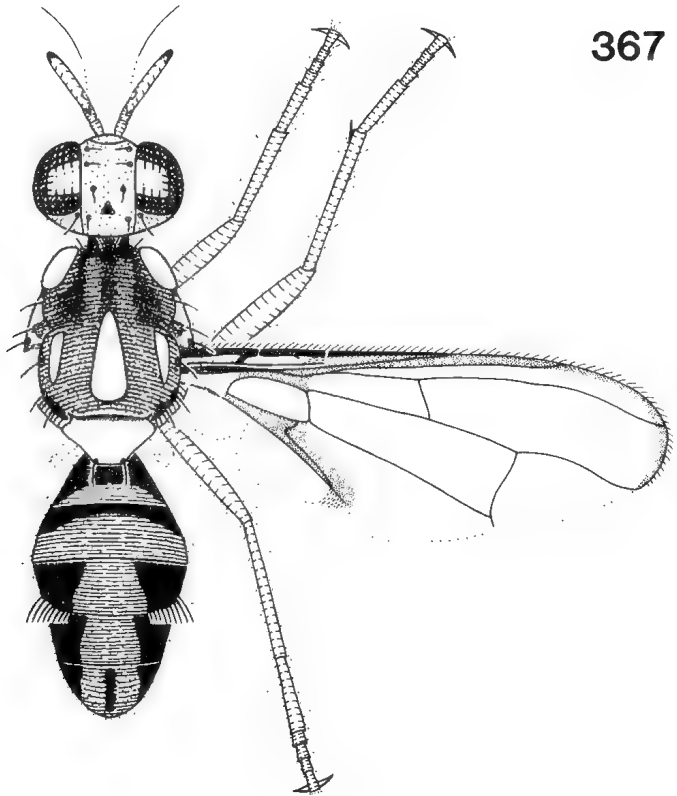


365

FIG. 364. *Bactrocera* (*Paratridacus*) *unichromata* n. sp., adult male (x9). FIG. 365. *Bactrocera* (*Sinodacus*) *abdopallescens* (Drew), adult male (x13).

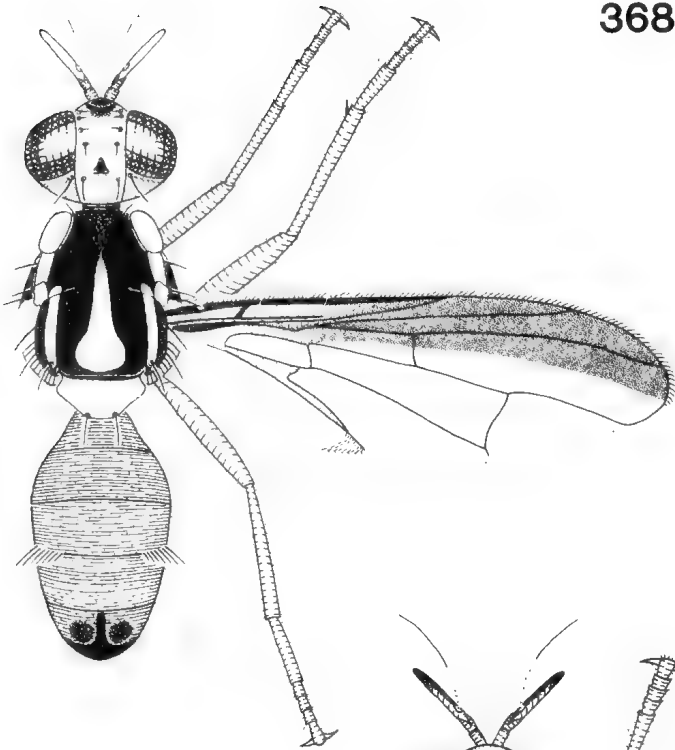


366

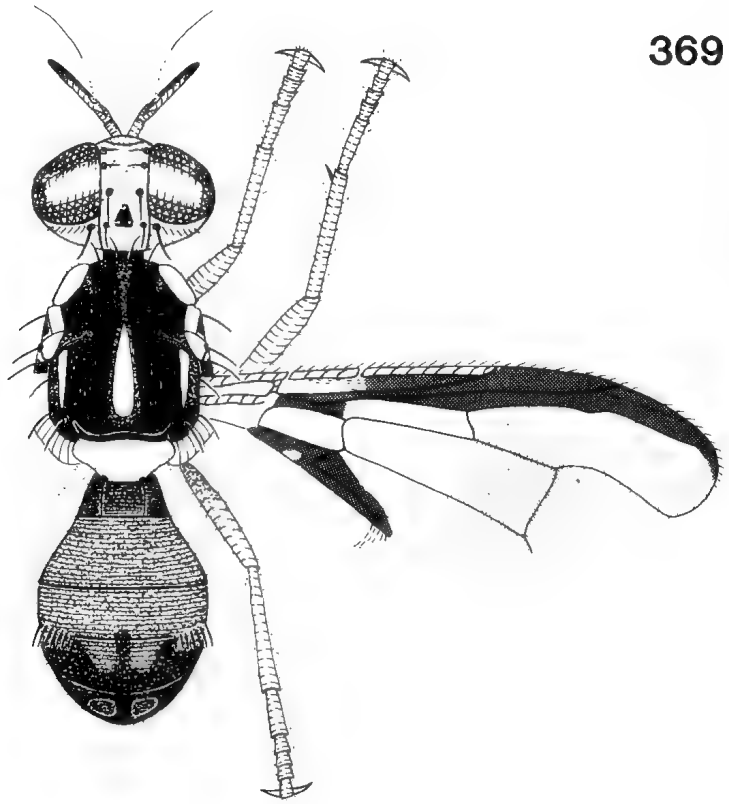


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FIG. 366. *Bactrocera (Sinodacus) aneuvittata* (Drew), adult male (x11). FIG. 367. *Bactrocera (Sinodacus) angusticostata* n. sp., adult male (x12).

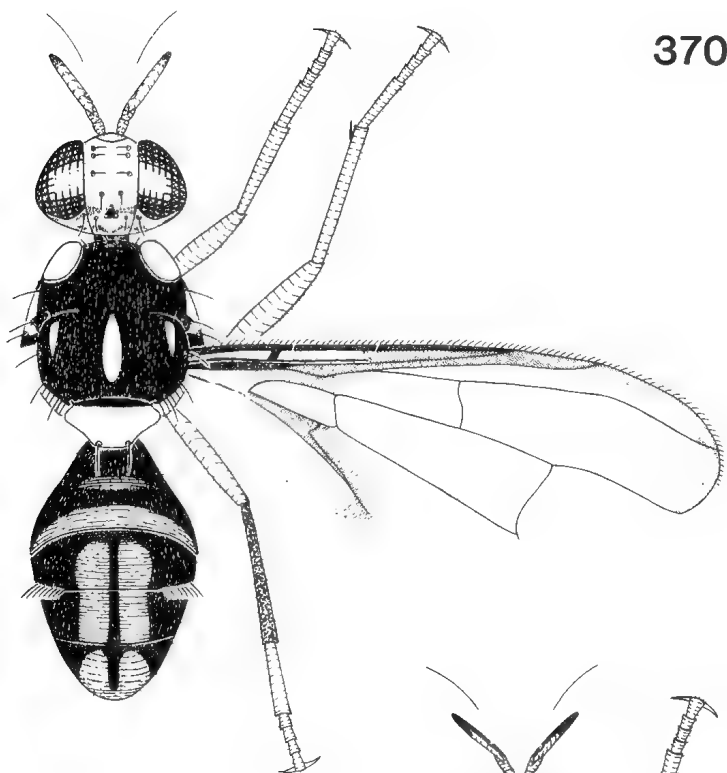


368

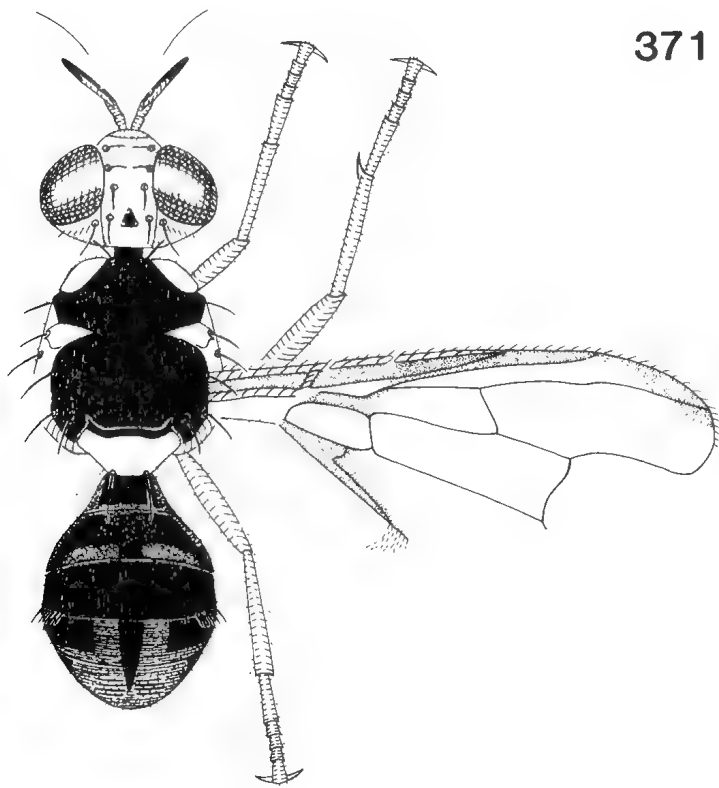


369

FIG. 368. *Bactrocera* (*Sinodacus*) *buvittata* n. sp., adult male (x11). FIG. 369. *Bactrocera* (*Sinodacus*) *emarginata* (Perkins), adult male (x12).

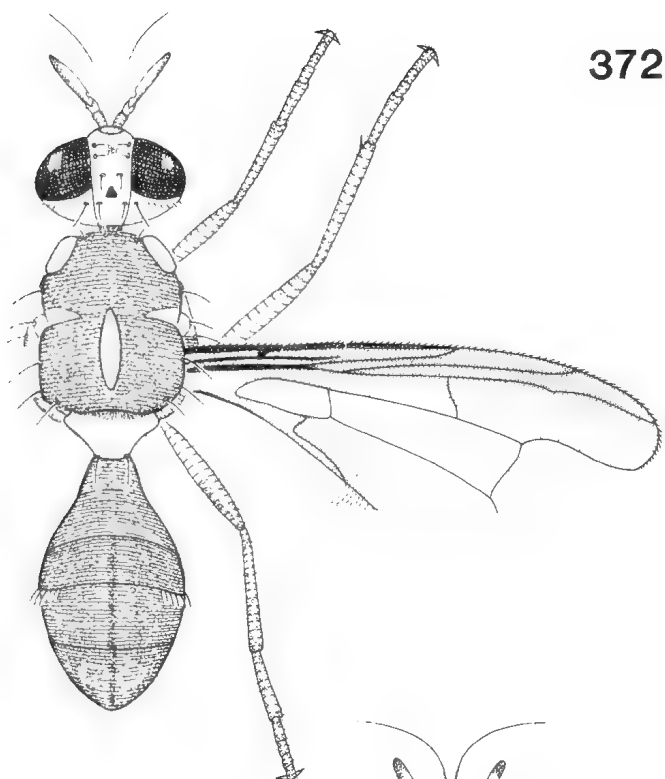


370

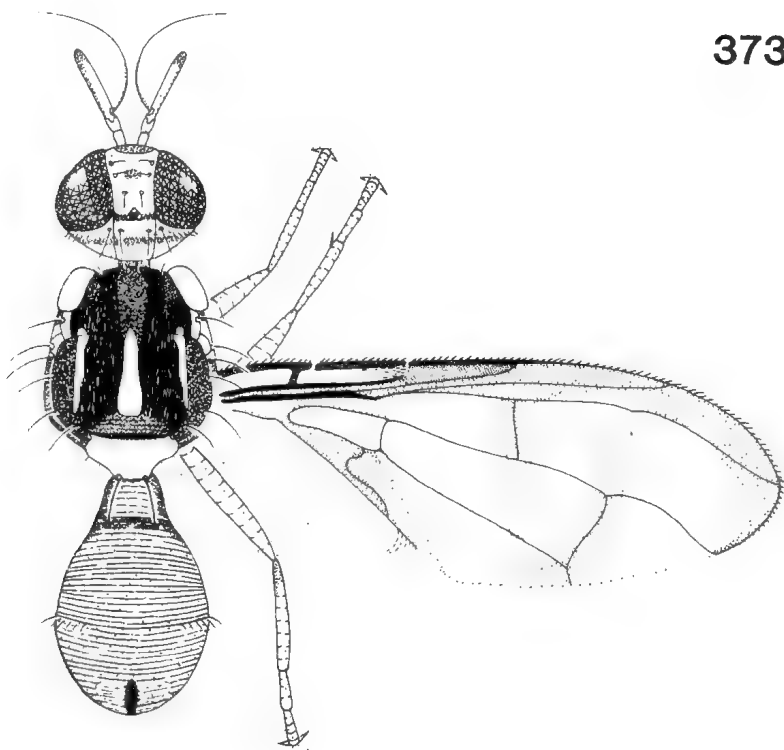


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FIG. 370. *Bactrocera* (*Sinodacus*) *paulula* n. sp., adult male (x16). FIG. 371. *Bactrocera* (*Sinodacus*) *perpusilla* (Drew), adult male (x15).

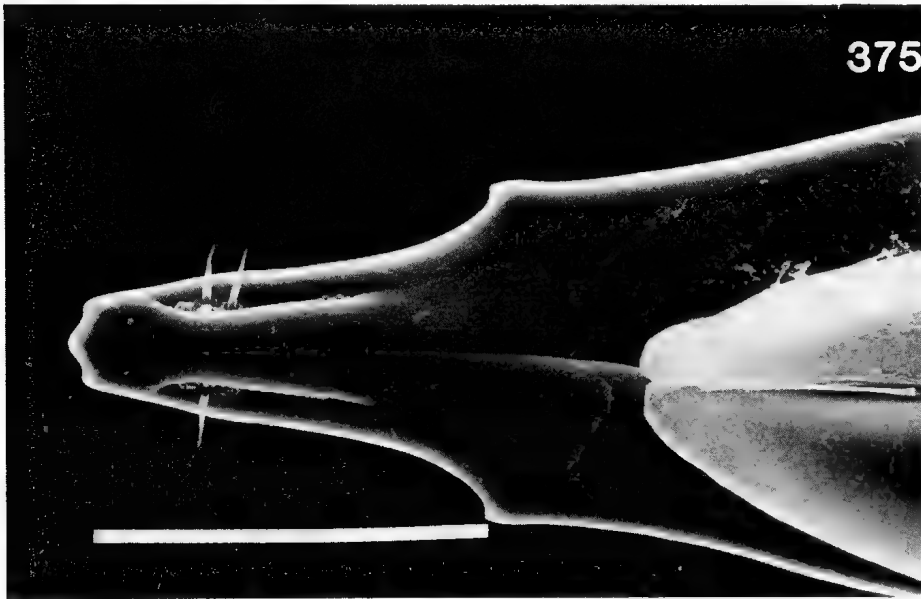
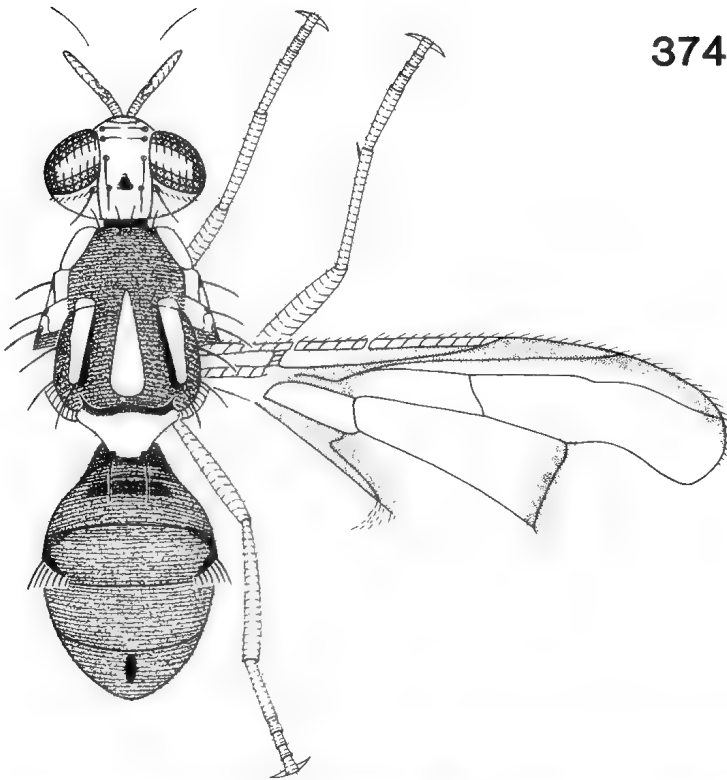


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FIG. 372. *Bactrocera* (*Sinodacus*) *salamander* (Drew and Hancock), adult male (x9). FIG. 373. *Bactrocera* (*Sinodacus*) *sepikae* n. sp., adult male (x14).



FIGS 374–375. *Bactrocera* (*Sinodacus*) *strigifinis* (Walker): 374, adult male (x11); 375, apex of aculeus (scale 0.1 mm).

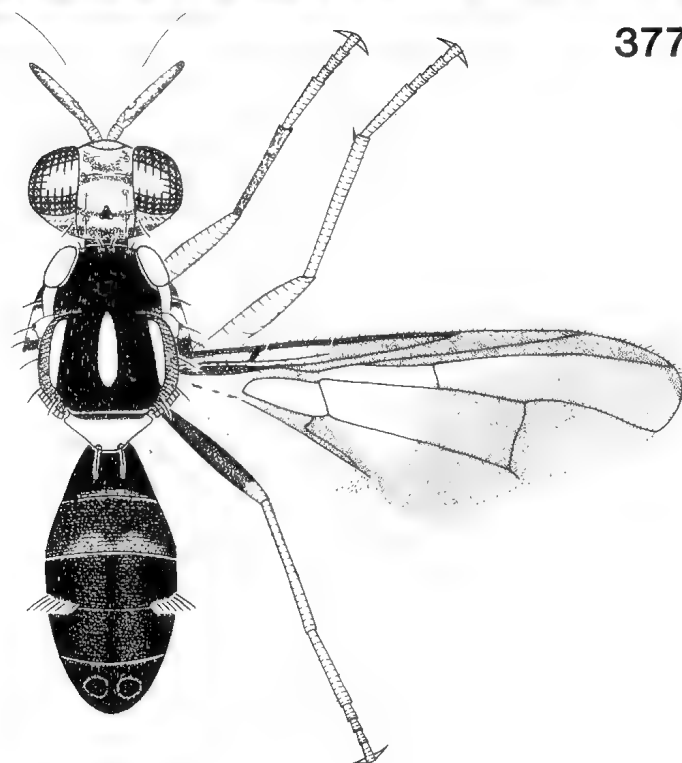
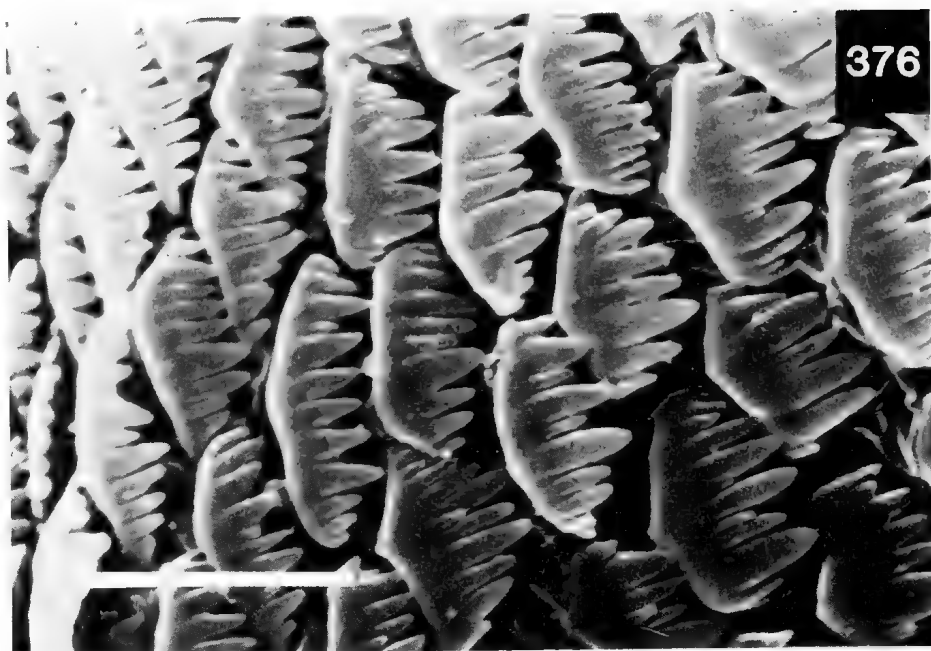
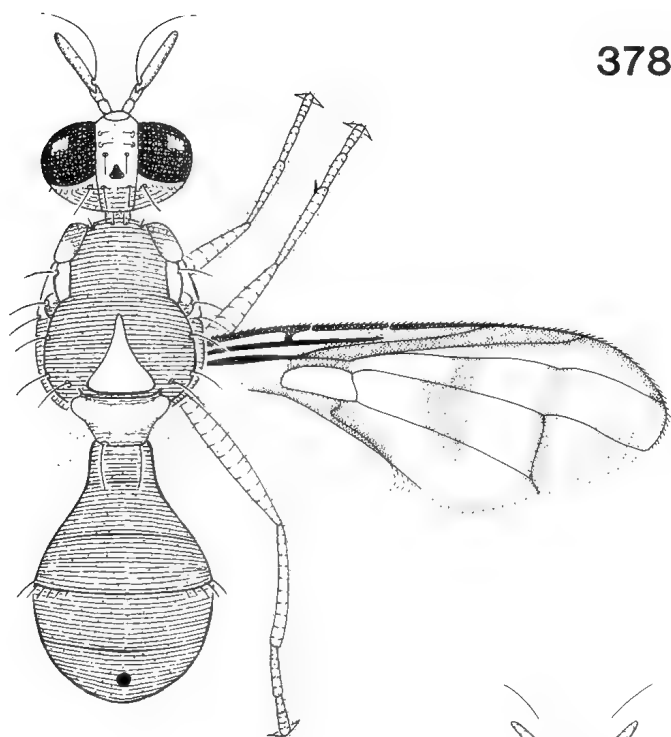
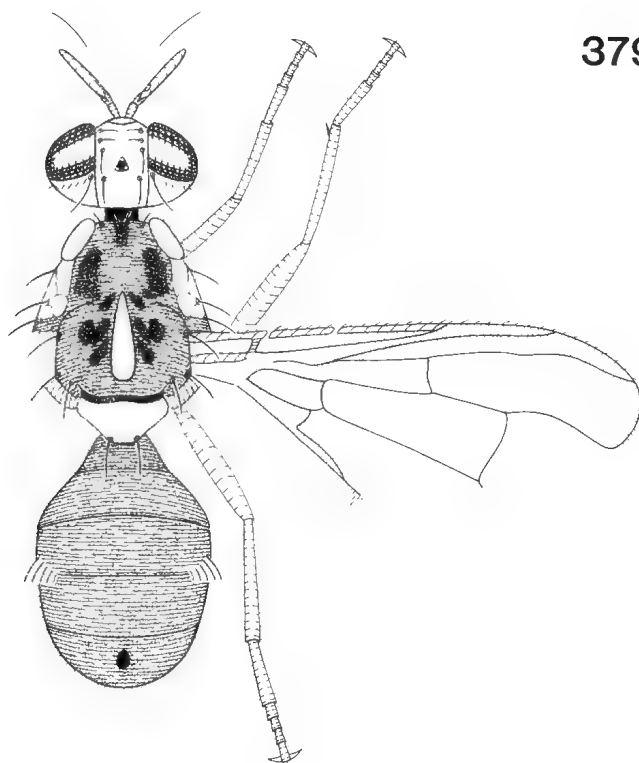


FIG. 376. *Bactrocera (Sinodacus) strigifinis* (Walker), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 377. *Bactrocera (Sinodacus) surrufula* n. sp., adult male (x12).

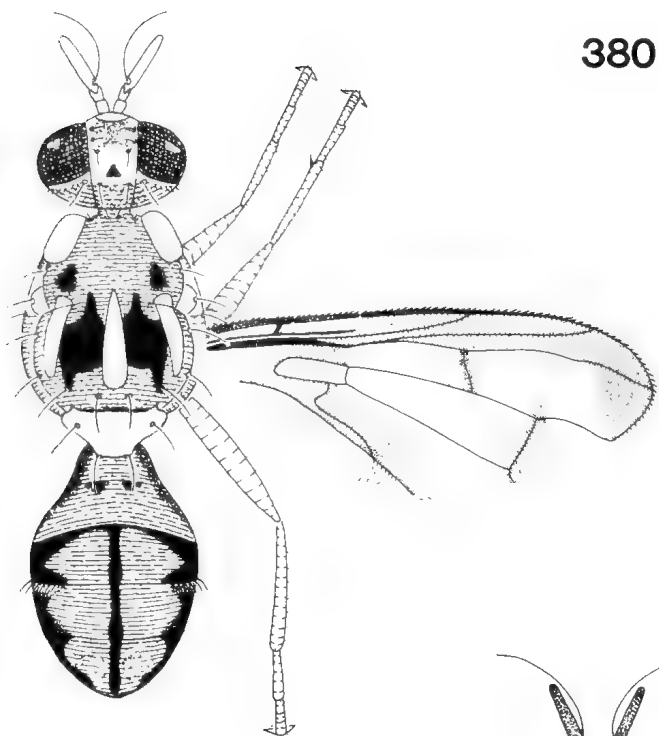


378

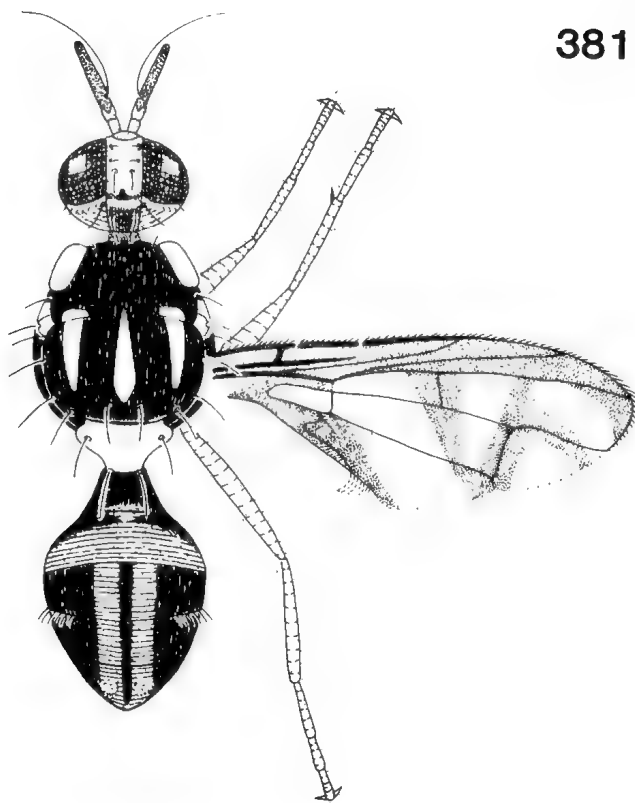


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FIG. 378. *Bactrocera* (*Sinodacus*) *triangularis* (Drew), adult male (x11). FIG. 379. *Bactrocera* (*Sinodacus*) *univittata* (Drew), adult male (x10).



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381

FIG. 380. *Bactrocera* (*Zeugodacus*) *abdoangusta* (Drew), adult male (x7). FIG. 381. *Bactrocera* (*Zeugodacus*) *amoena* (Drew), adult male (x11).

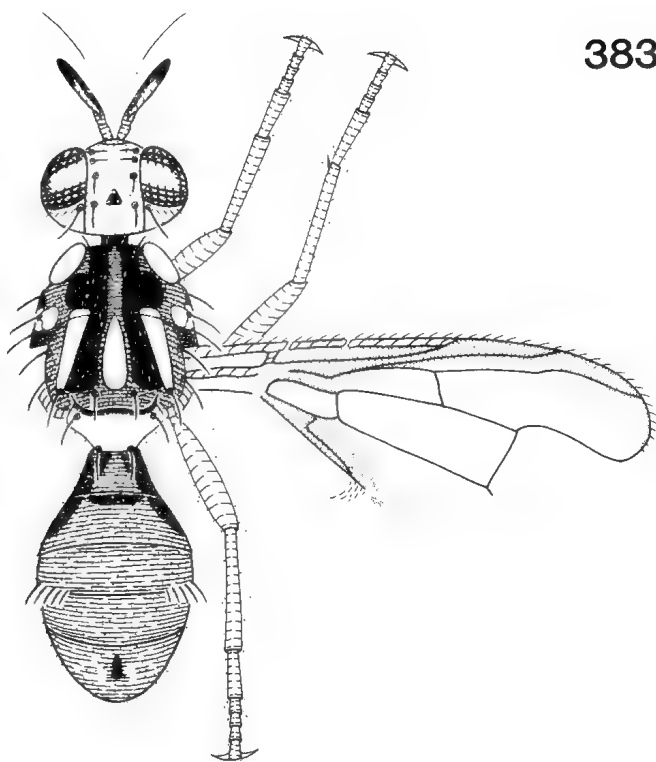
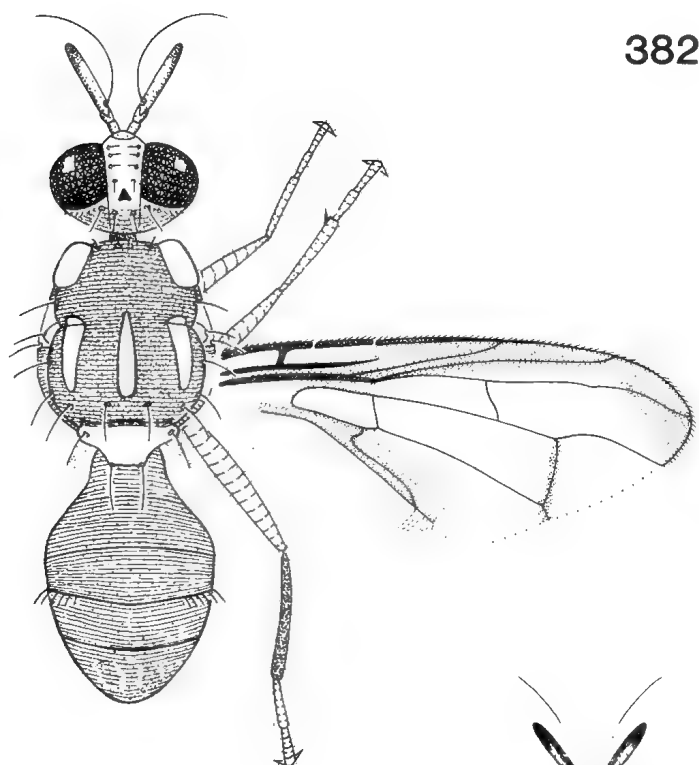
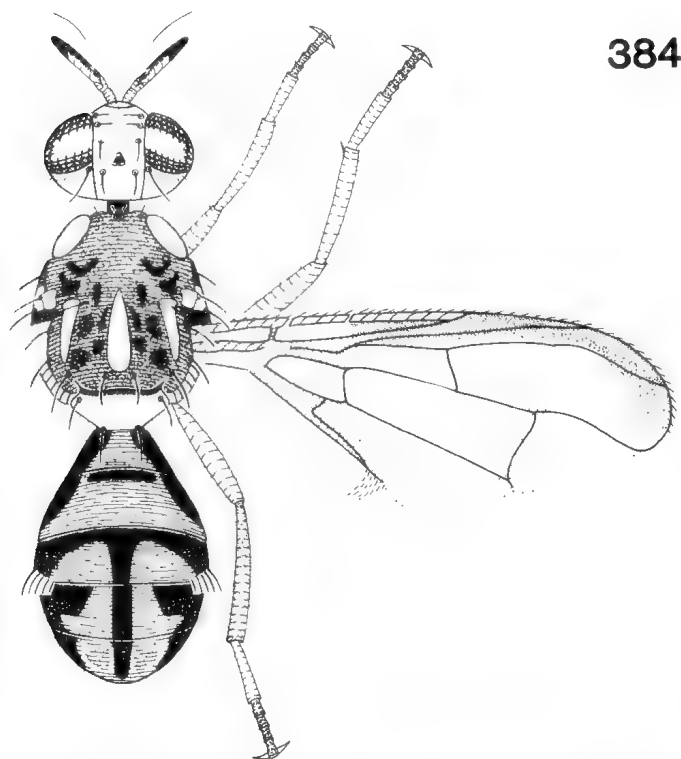
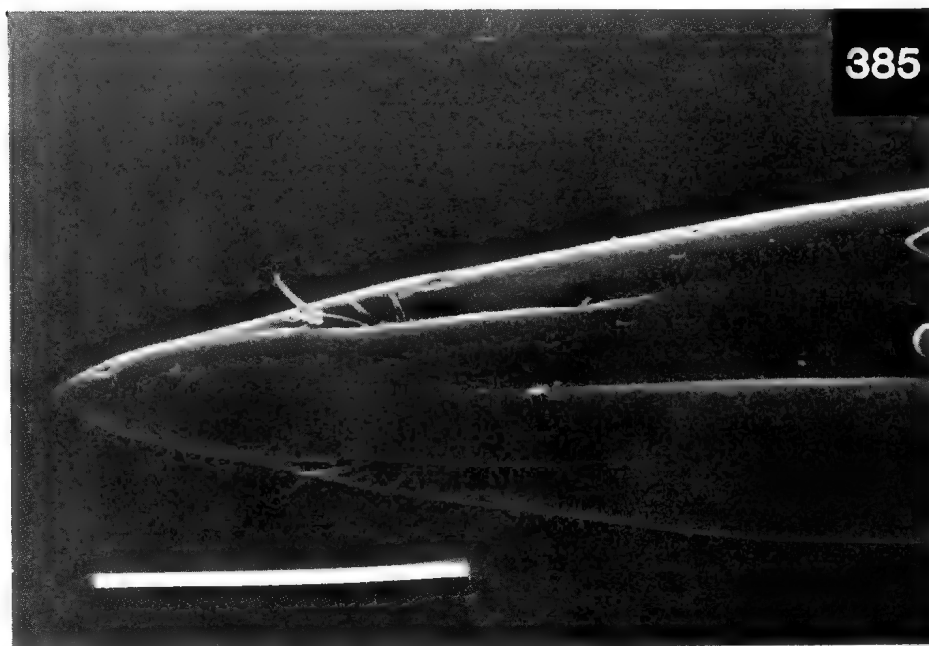


FIG. 382. *Bactrocera* (*Zeugodacus*) *anchitrichota* n. sp., adult male (x9). FIG. 383. *Bactrocera* (*Zeugodacus*) *brachus* (Drew), adult male (x11).



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385

FIGS 384–385. *Bactrocera (Zeugodacus) chorista* (May): 384, adult male (x8); 385, apex of aculeus (scale 0.1 mm).

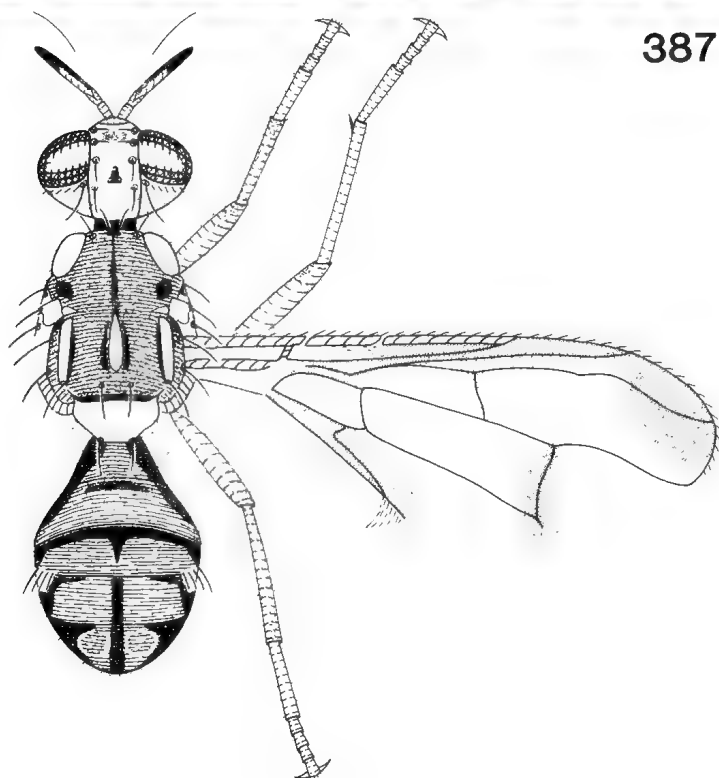
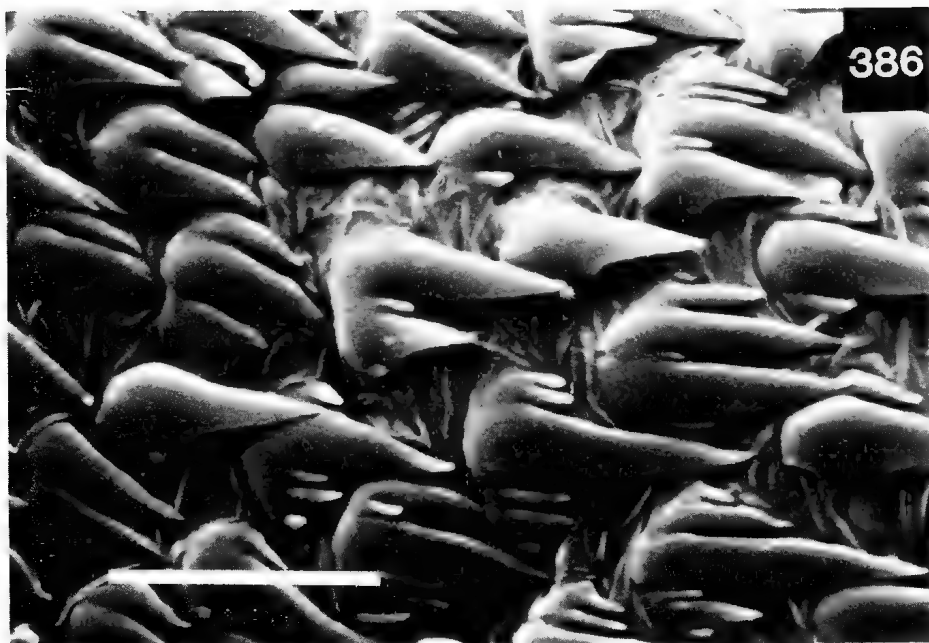
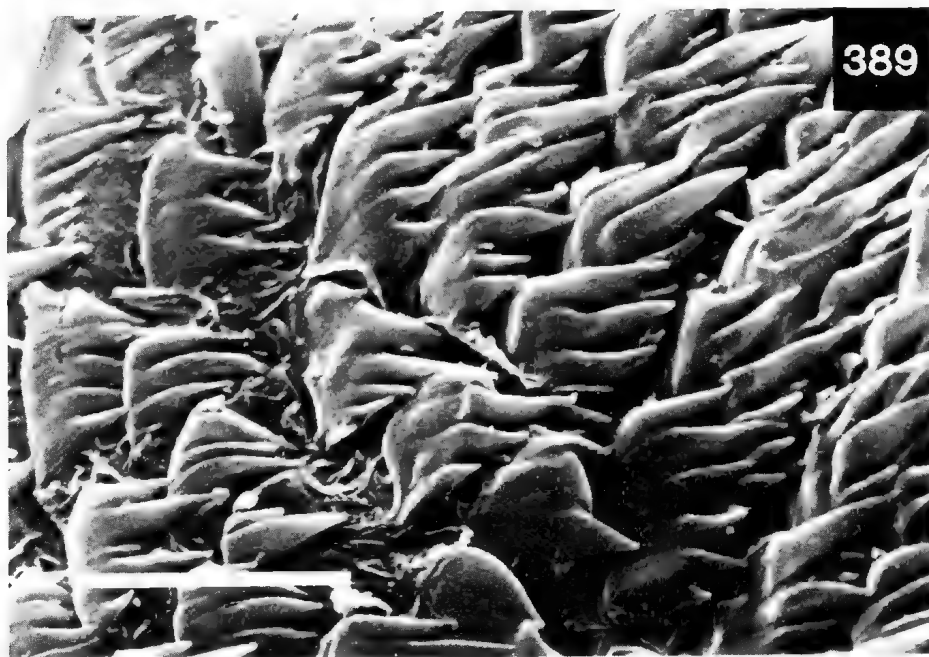
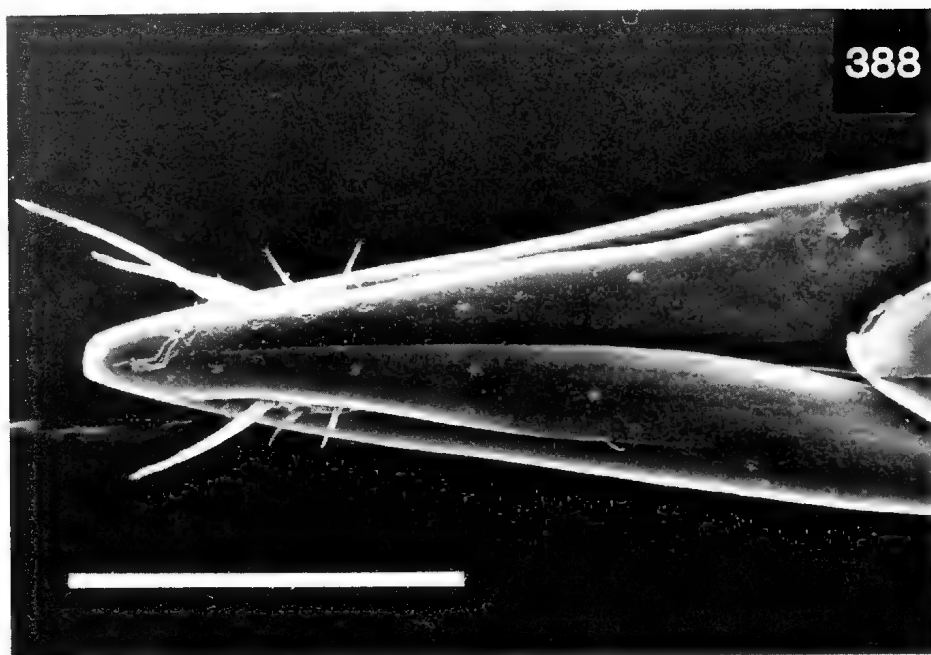
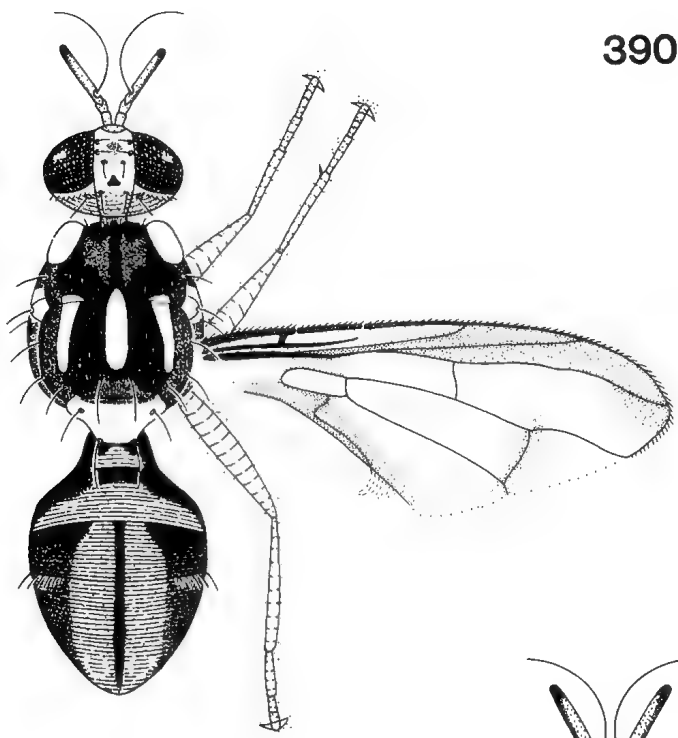


FIG. 386. *Bactrocera* (*Zeugodacus*) *chorista* (May), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 387. *Bactrocera* (*Zeugodacus*) *cucurbitae* (Coquillett), adult male (x10).



FIGS 388–389. *Bactrocera* (*Zeugodacus*) *cucurbitae* (Coquillett): 388, apex of aculeus (scale 0.1 mm); 389, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

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391

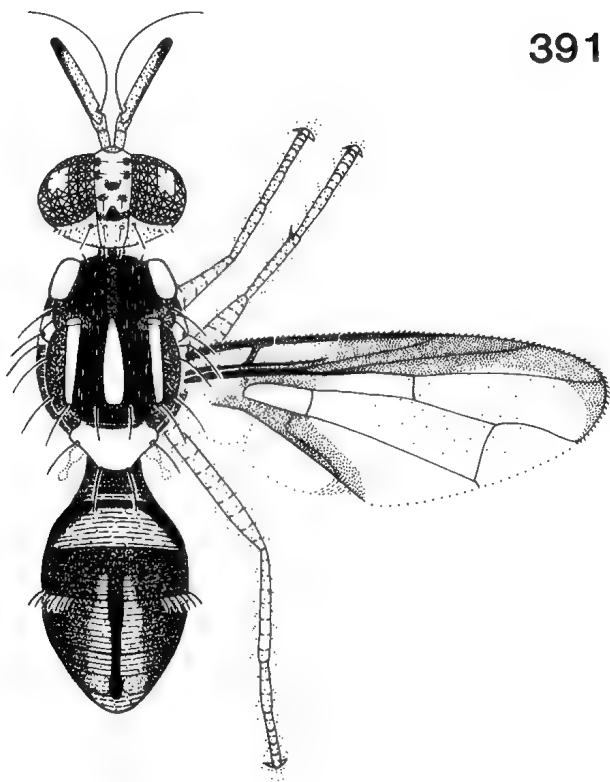
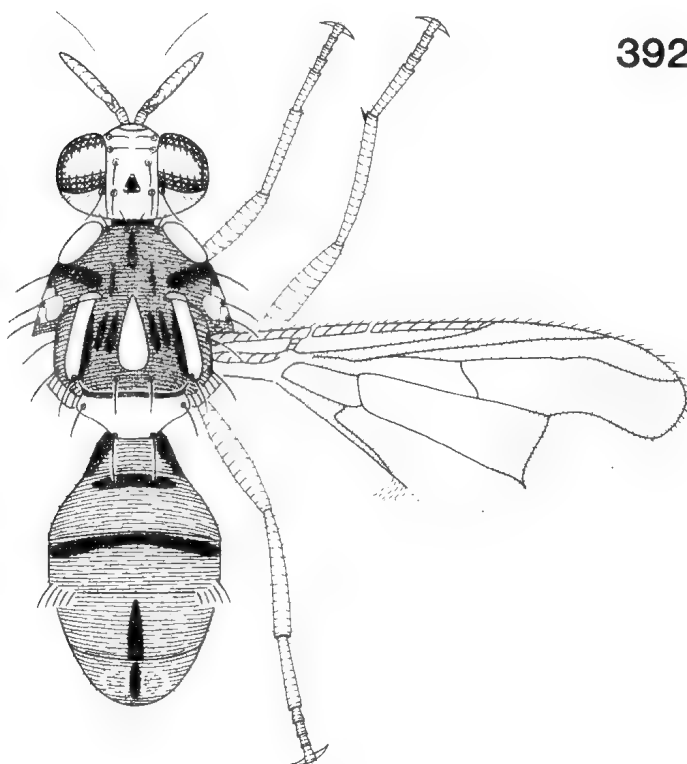
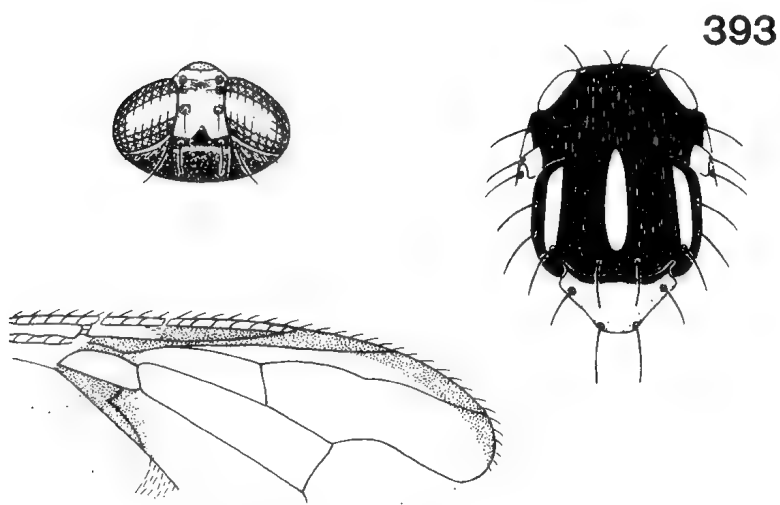


FIG. 390. *Bactrocera* (*Zeugodacus*) *curta* (Drew), adult male (x8). FIG. 391. *Bactrocera* (*Zeugodacus*) *daula* n. sp., adult male (x10).

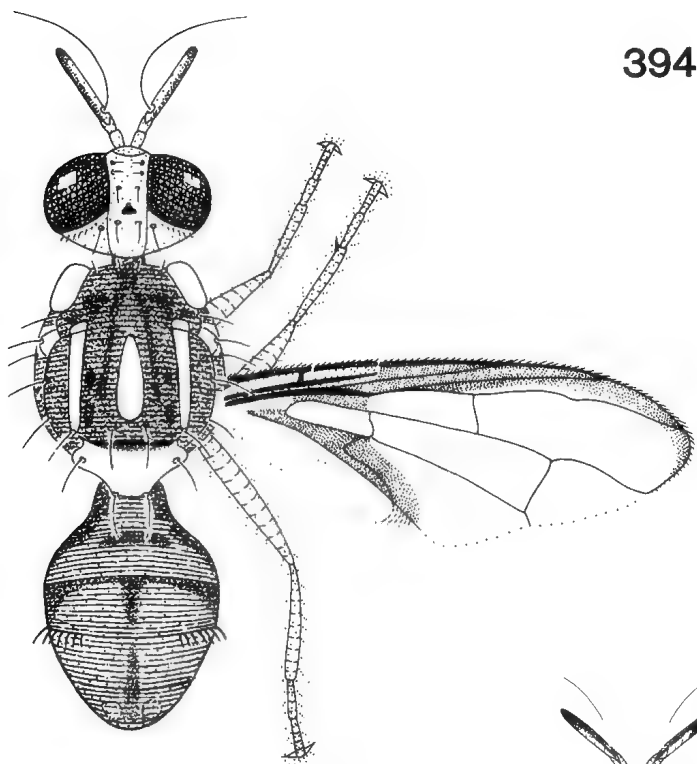


392

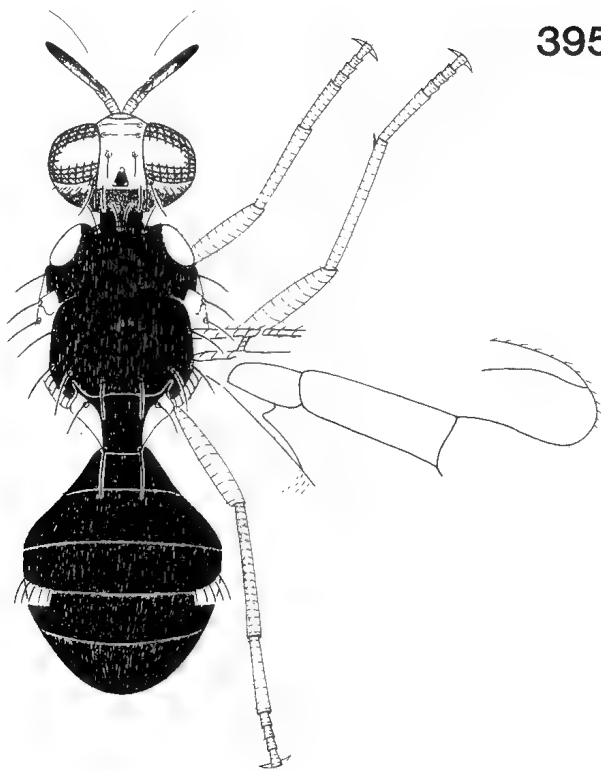


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FIG. 392. *Bactrocera* (*Zeugodacus*) *emittens* (Walker), adult male (x8). FIG. 393. *Bactrocera* (*Zeugodacus*) *exornata* (Hering), adult male (x8).

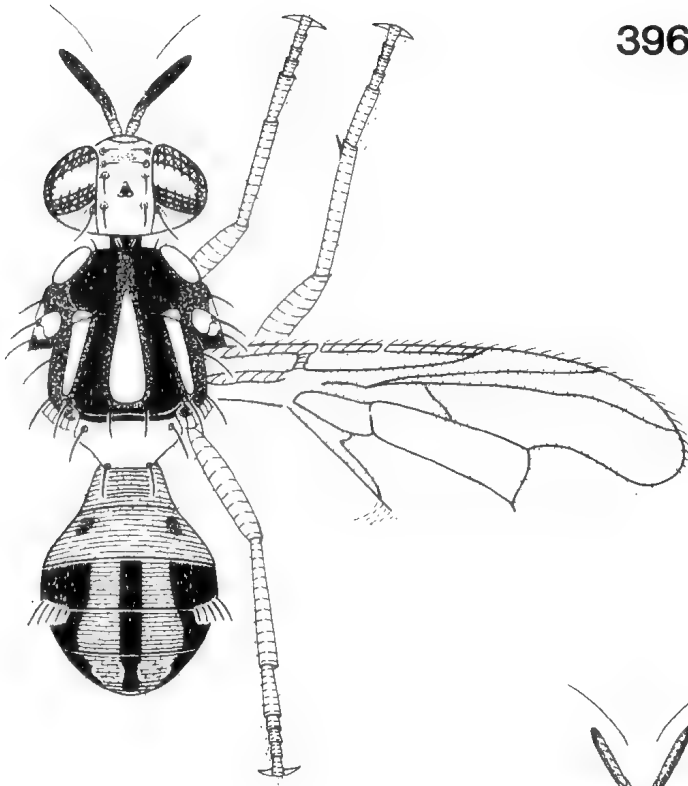


394

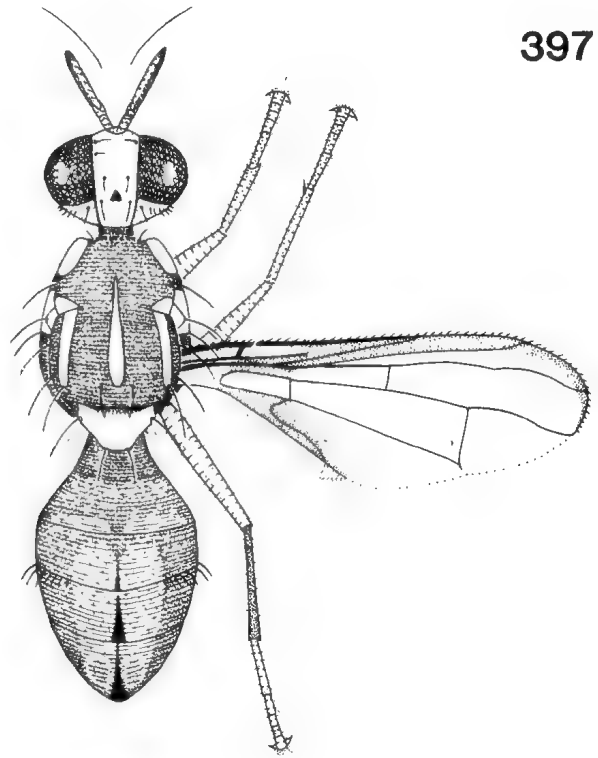


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FIG. 394. *Bactrocera* (*Zeugodacus*) *fallacis* (Drew), adult male (x12). FIG. 395. *Bactrocera* (*Zeugodacus*) *fulvifacies* (Perkins), adult male (x10).

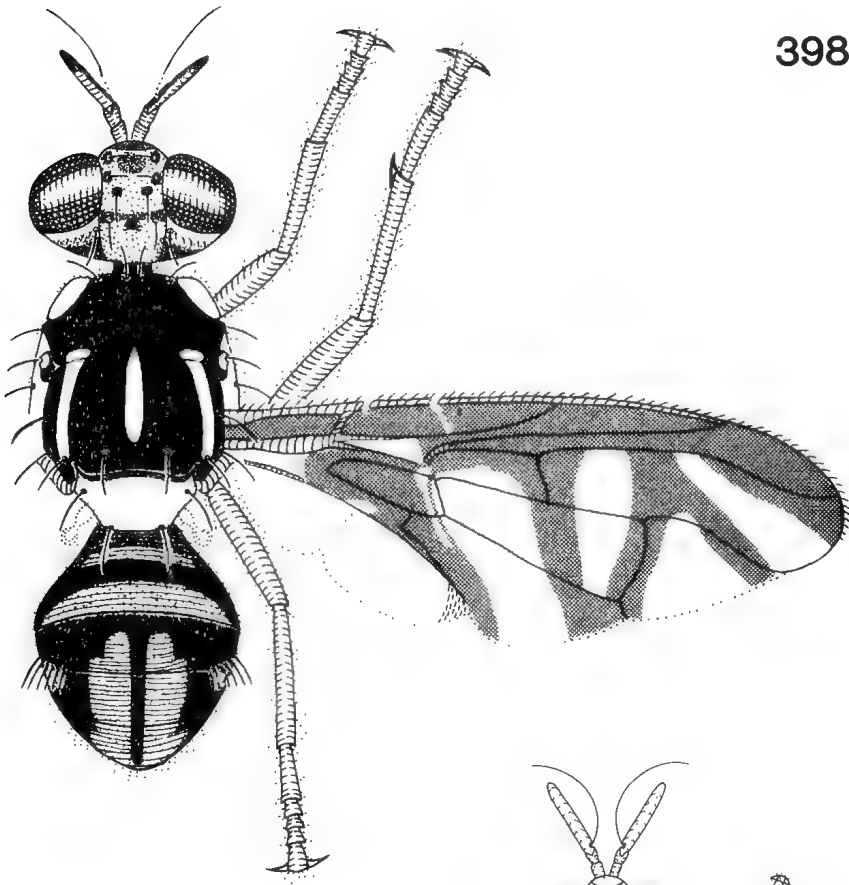


396

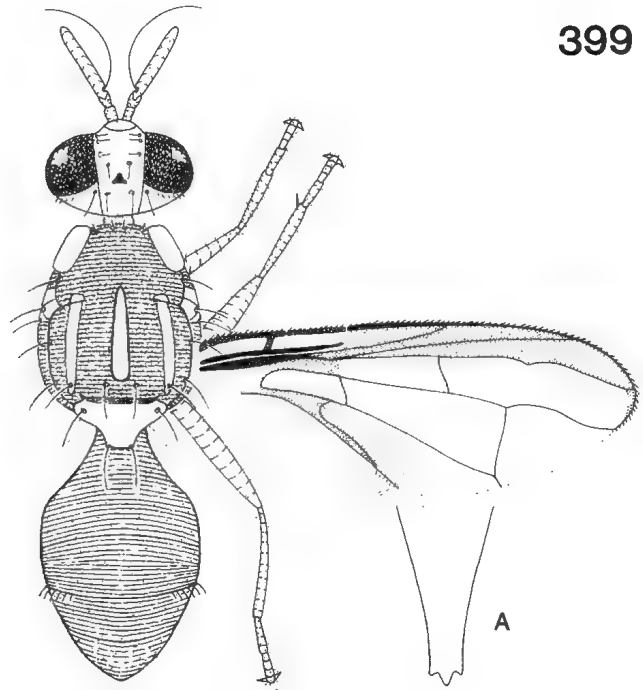


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FIG. 396. *Bactrocera* (*Zeugodacus*) *gracilis* (Drew), adult male (x12). FIG. 397. *Bactrocera* (*Zeugodacus*) *macrovittata* n. sp., adult male (x8).

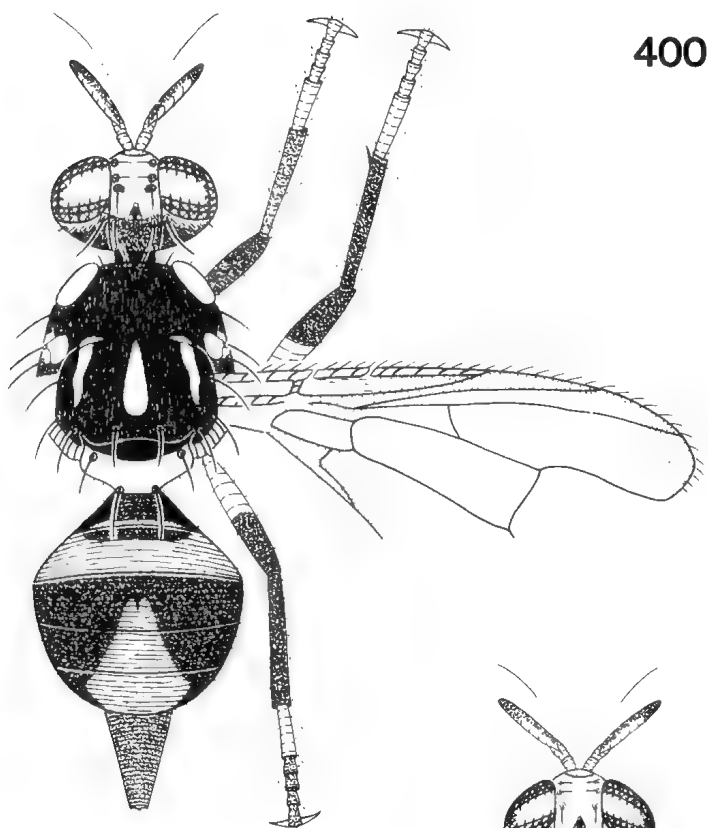


398

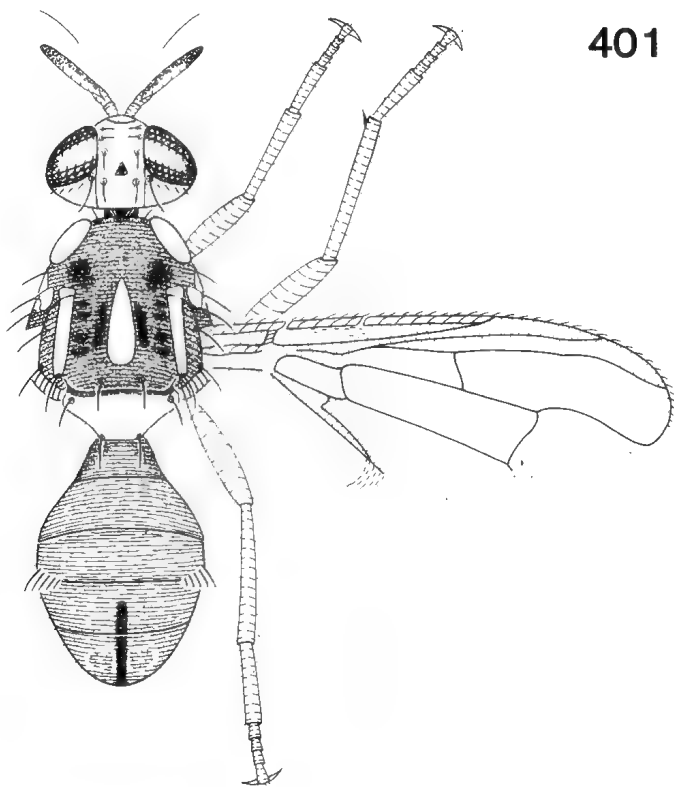


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FIG. 398. *Bactrocera* (*Zeugodacus*) *reflexa* (Drew), adult male (x13). FIG. 399. *Bactrocera* (*Zeugodacus*) *sandaracina* n. sp., adult male (x7). A, apex of aculeus.

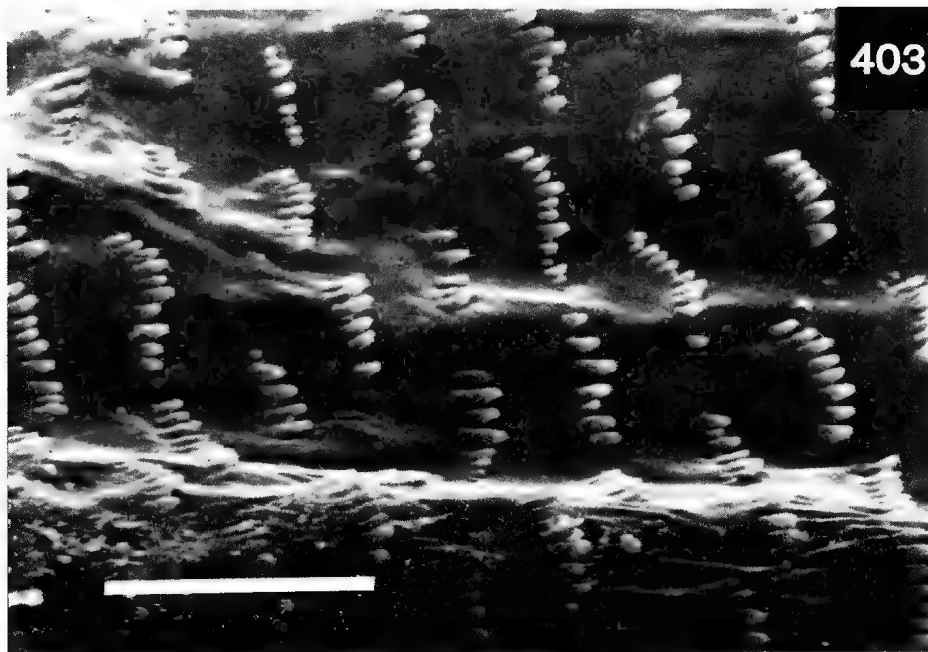
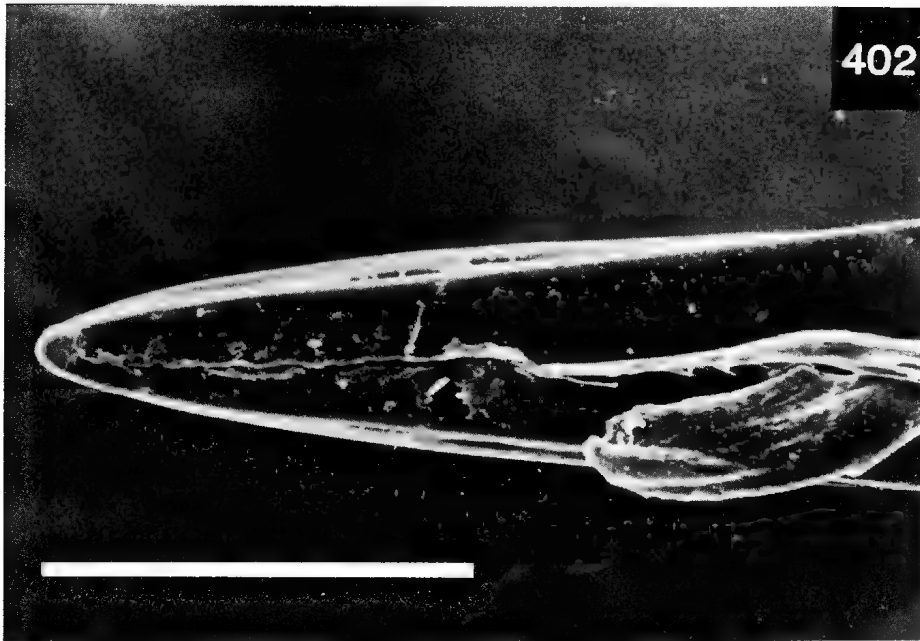


400



401

FIG. 400. *Bactrocera* (*Zeugodacus*) *timorensis* (Perkins), adult female (x13). FIG. 401. *Bactrocera* (*Zeugodacus*) *trichota* (May), adult male (x8).



FIGS 402–403. *Bactrocera* (*Zeugodacus*) *trichota* (May): 402, apex of aculeus (scale 0.1 mm); 403, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

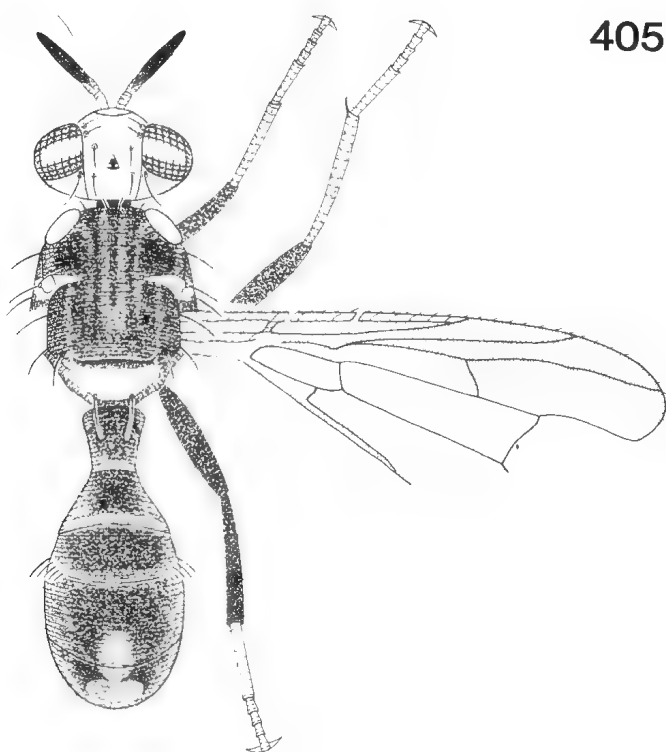
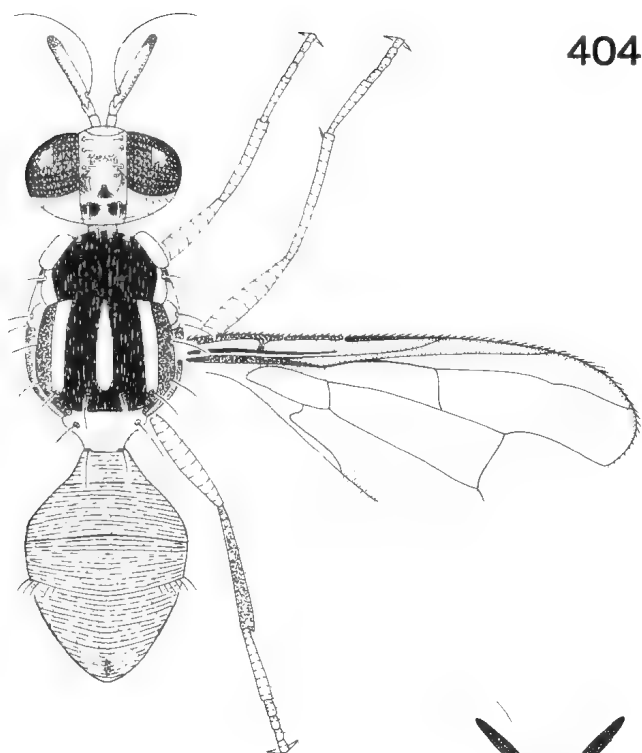
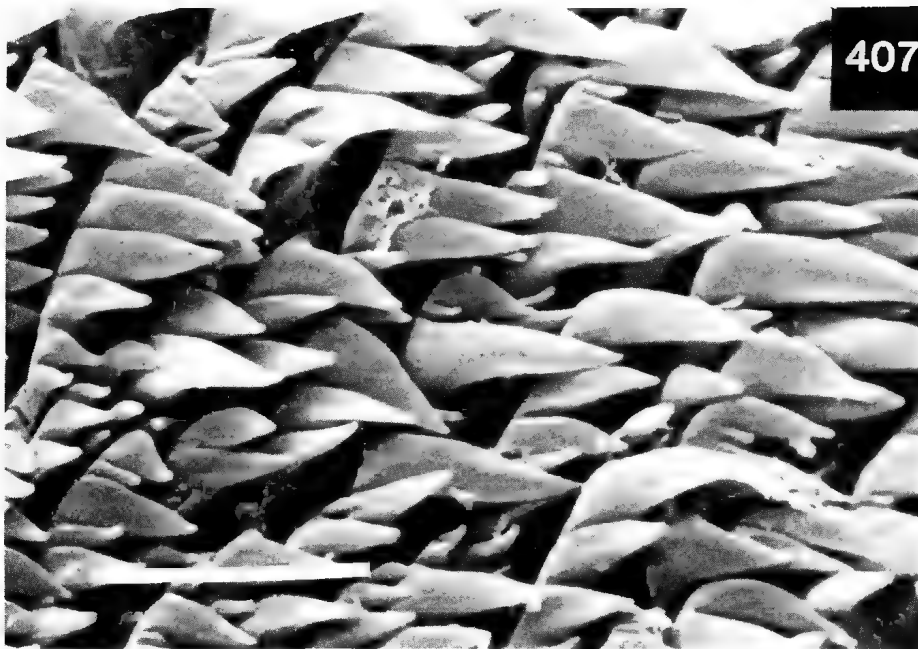
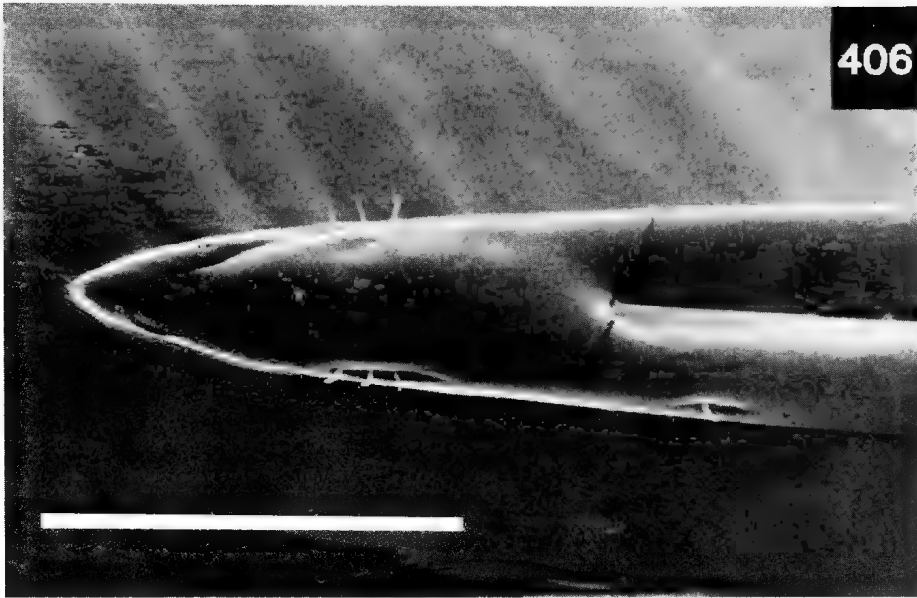
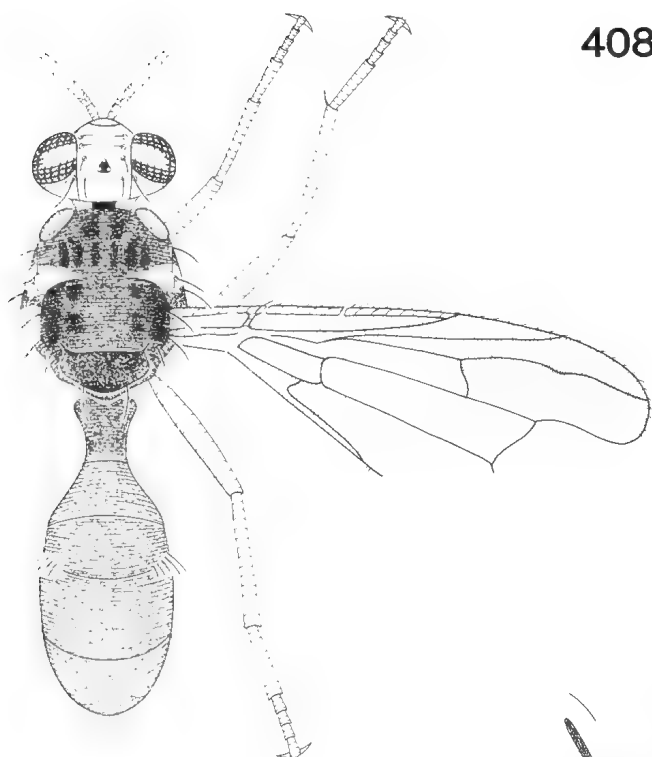


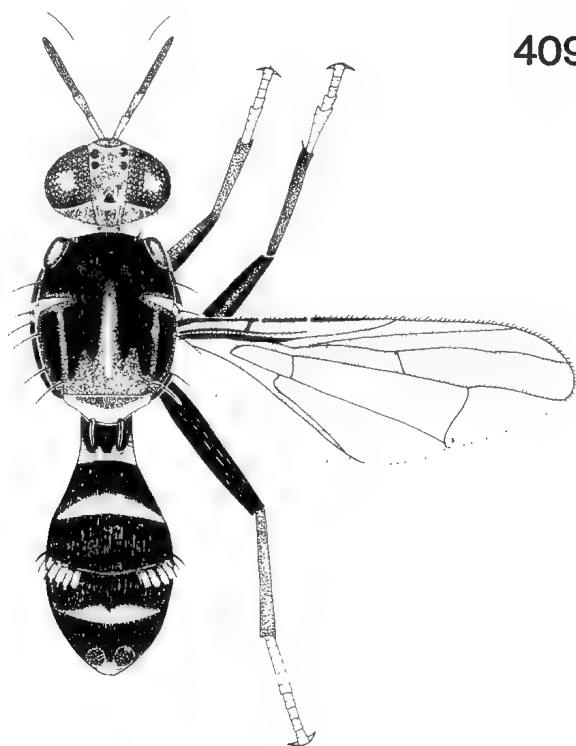
FIG. 404. *Bactrocera* (*Zeugodacus*) *unilateralis* n. sp., adult male (x8). FIG. 405. *Dacus* (*Callantra*) *axanus* (Hering), adult male (x7).



FIGS 406–407. *Dacus (Callantra) axanus* (Hering): 406, apex of aculeus (scale 0.1 mm); 407, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

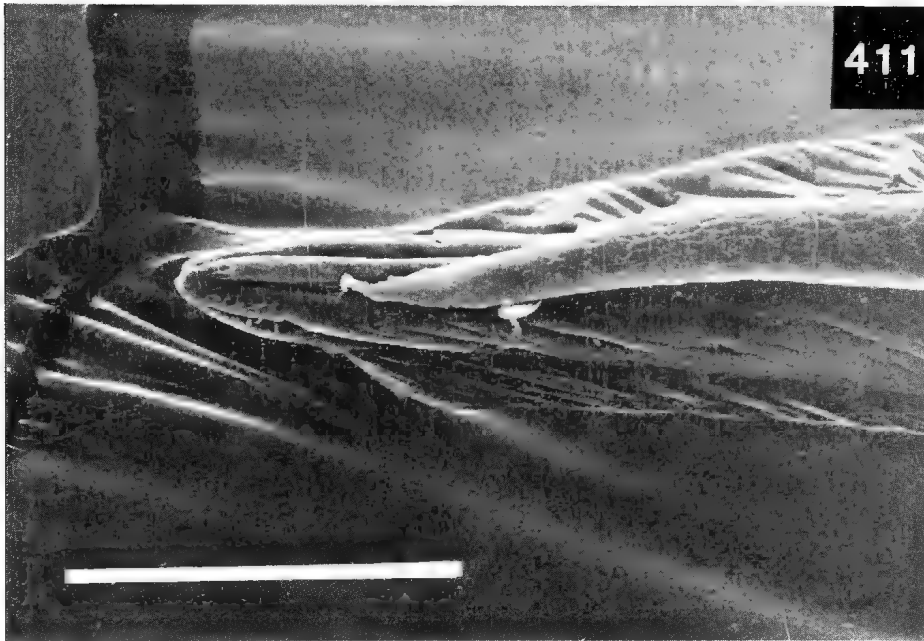
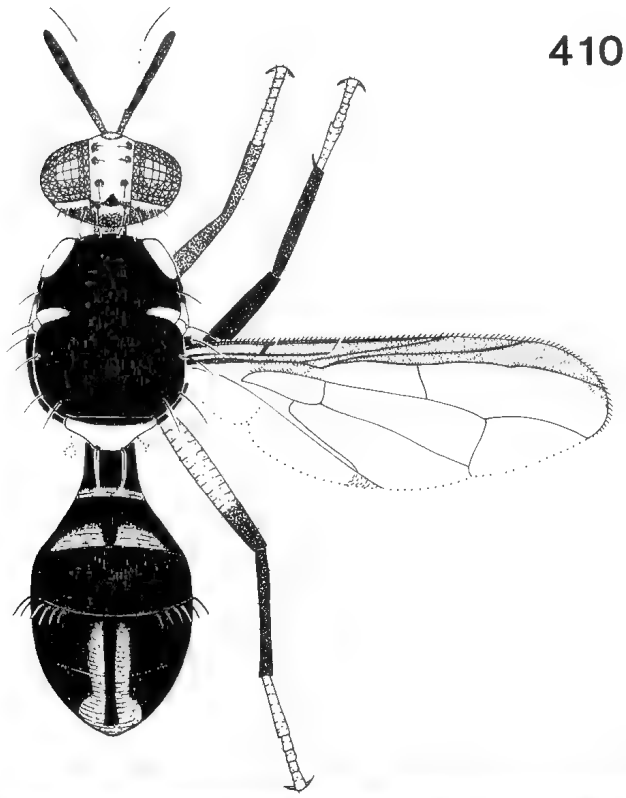


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FIG. 408. *Dacus (Callantra) capillaris* (Drew), adult male (x7). FIG. 409. *Dacus (Callantra) discors* n. sp., adult male (x7).



FIGS 410–411. *Dacus (Callantra) impar* n. sp.: 410, adult male (x11); 411, apex of aculeus (scale 0.1 mm).

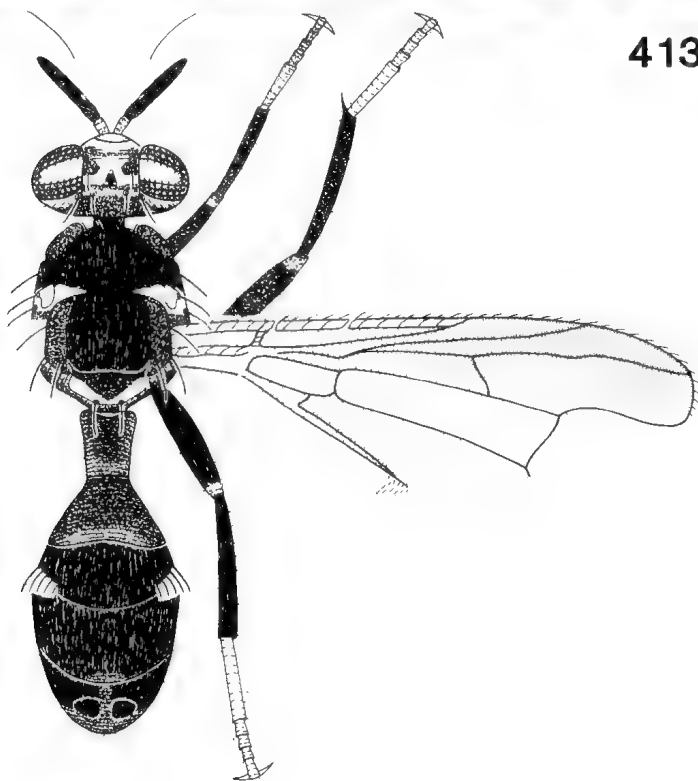
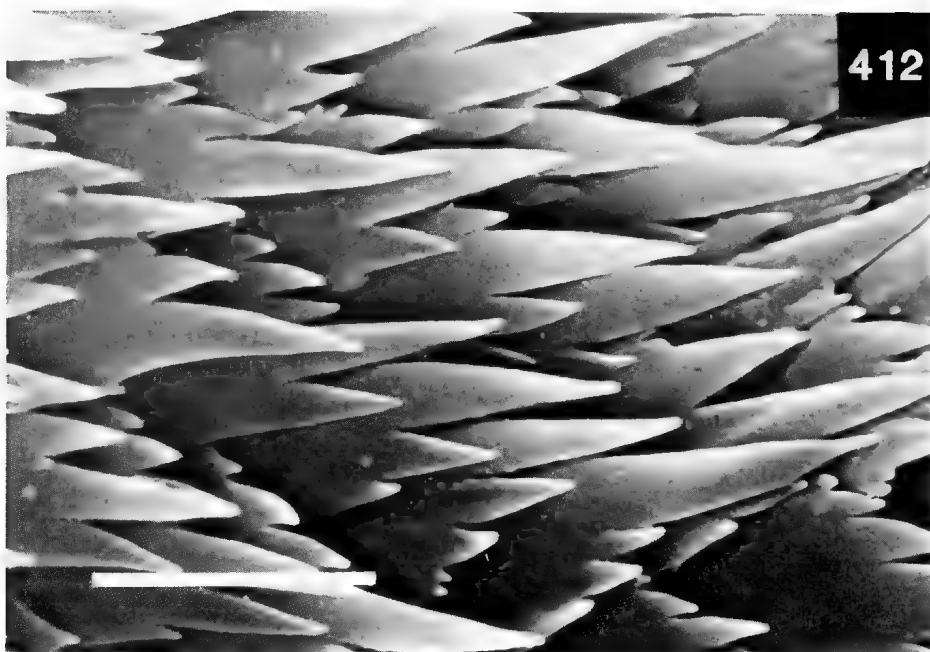


FIG. 412. *Dacus (Callantra) impar* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm).
FIG. 413. *Dacus (Callantra) mayi* (Drew), adult male (x7).

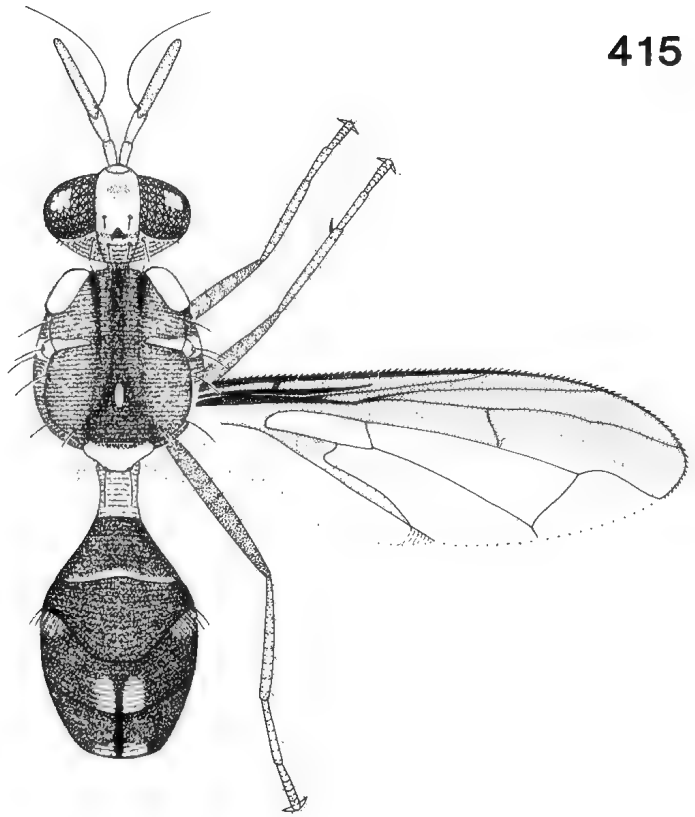
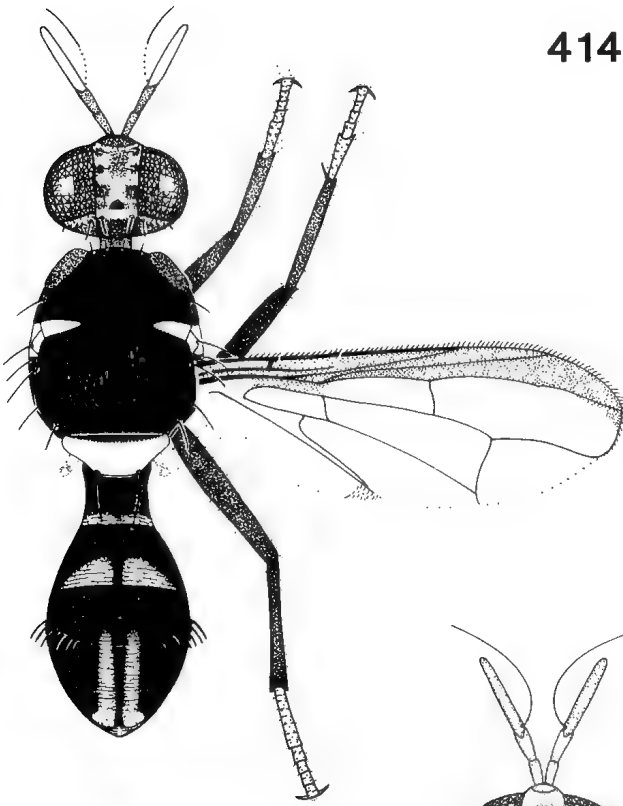
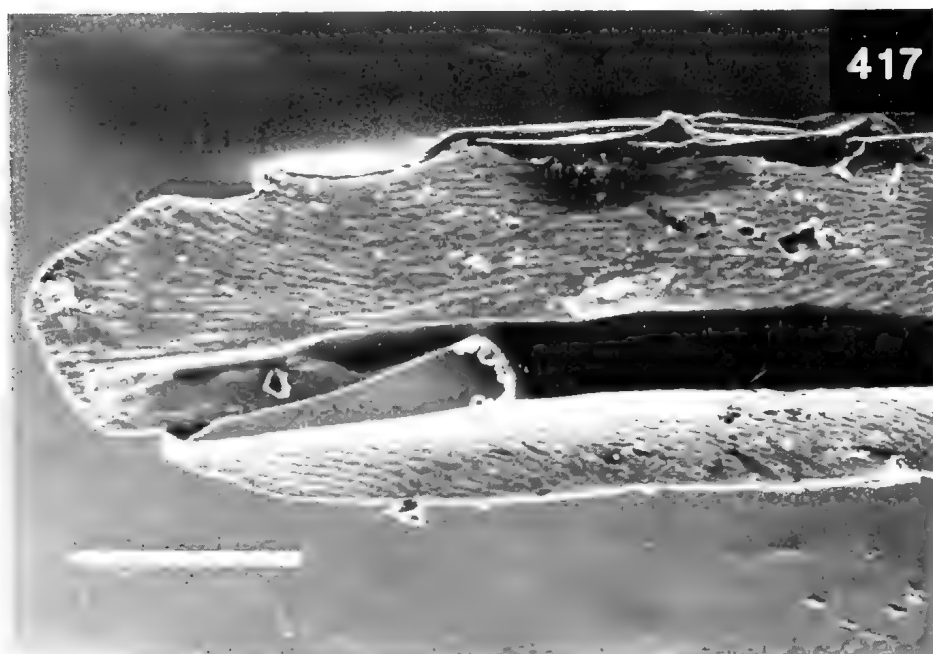
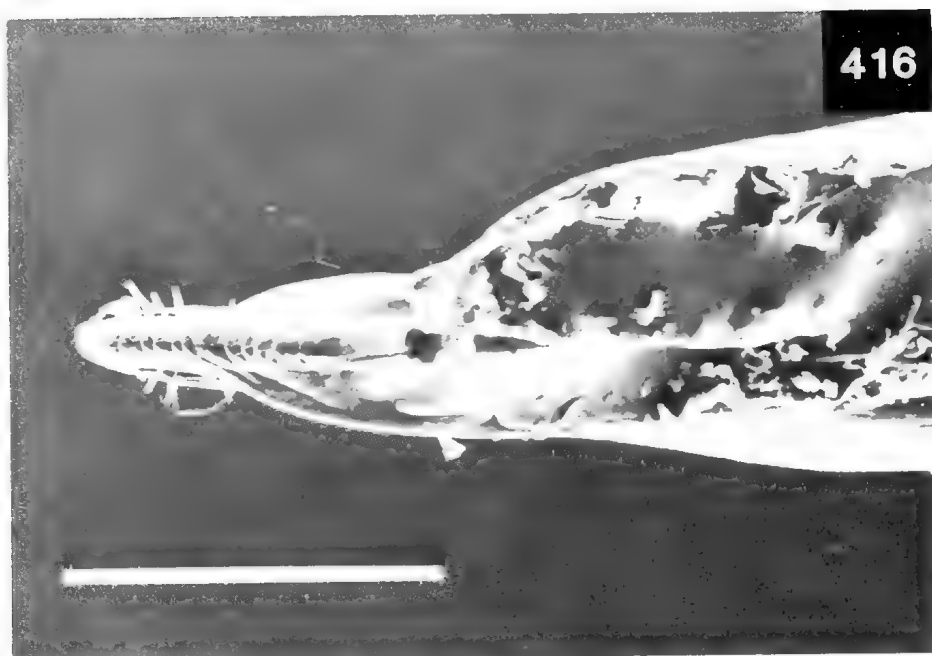


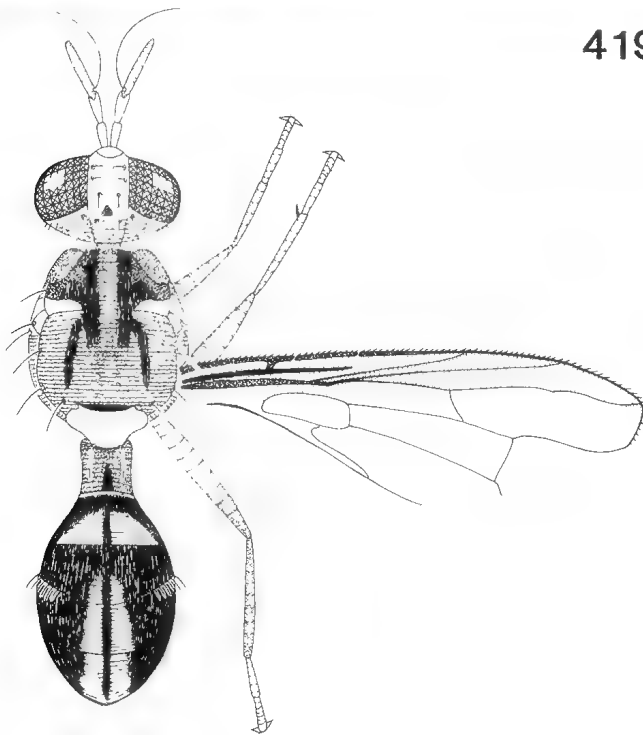
FIG. 414. *Dacus (Callantra) melanohumeralis* n. sp., adult male (x9). FIG. 415. *Dacus (Callantra) petioliforma* (May), adult male (x7).



FIGS 416–417. *Dacus (Callantra) petioliforma* (May): 416, apex of aculeus dorsal view (scale 0.1 mm); 417, apex of aculeus lateral view (scale 0.1 mm).

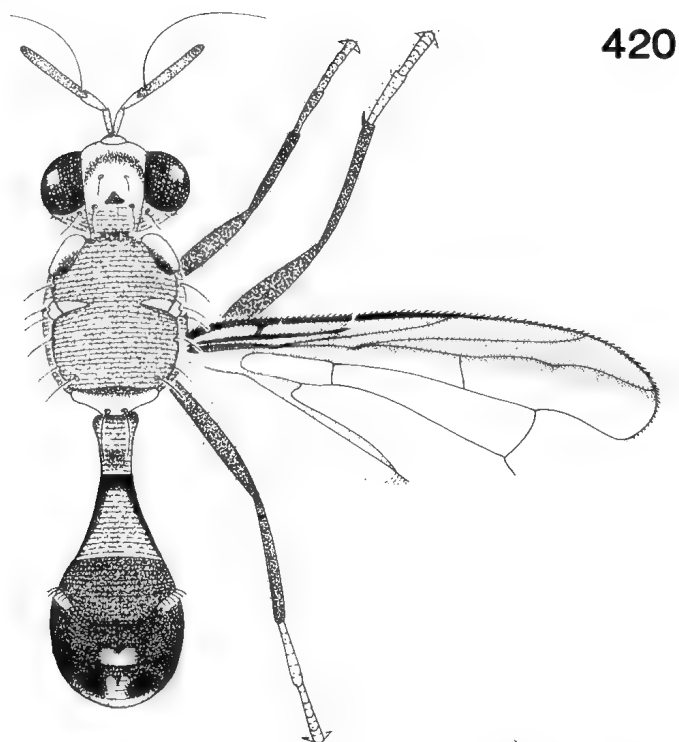


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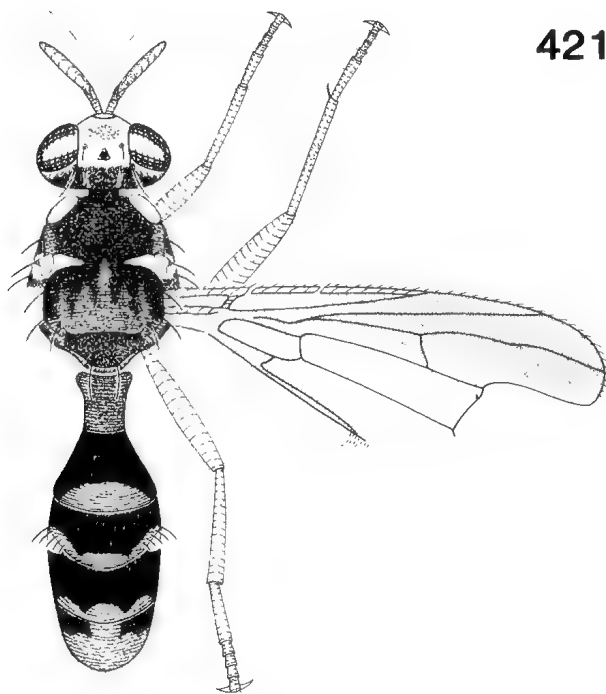


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FIG. 418. *Dacus (Callantra) petioliforma* (May), spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 419. *Dacus (Callantra) pusillus* (May), adult male (x11).

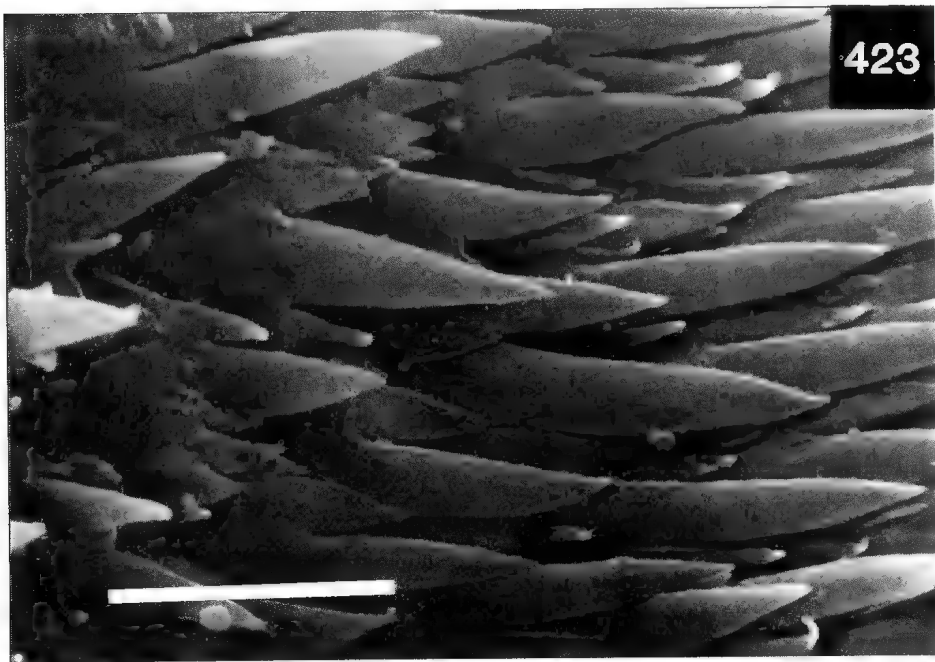
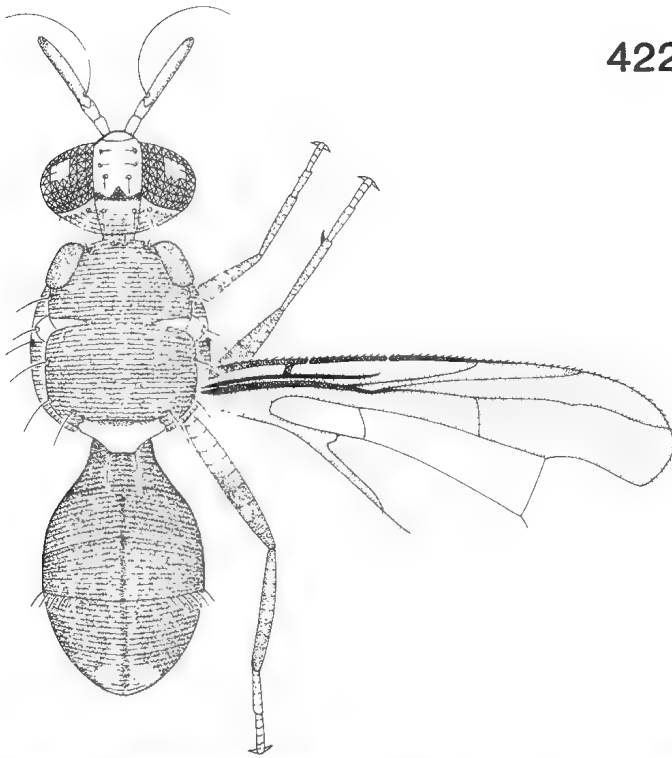


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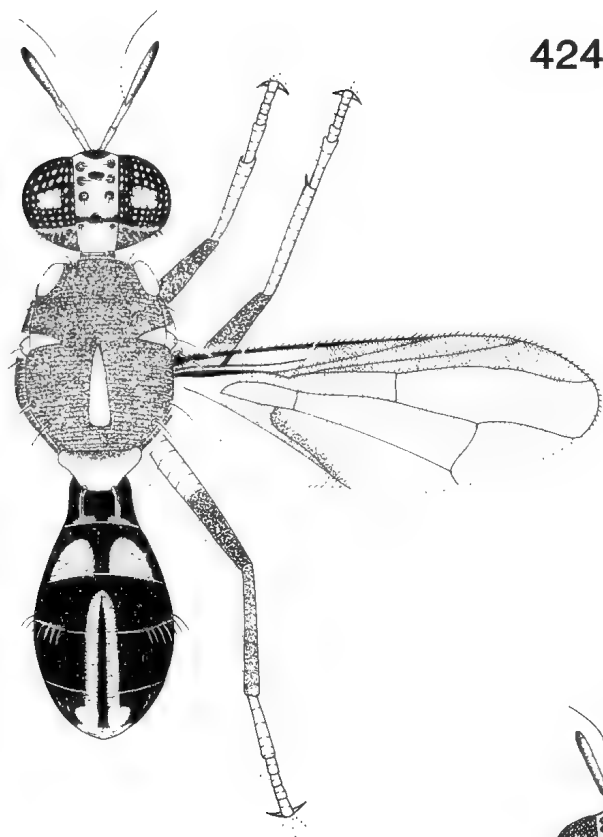


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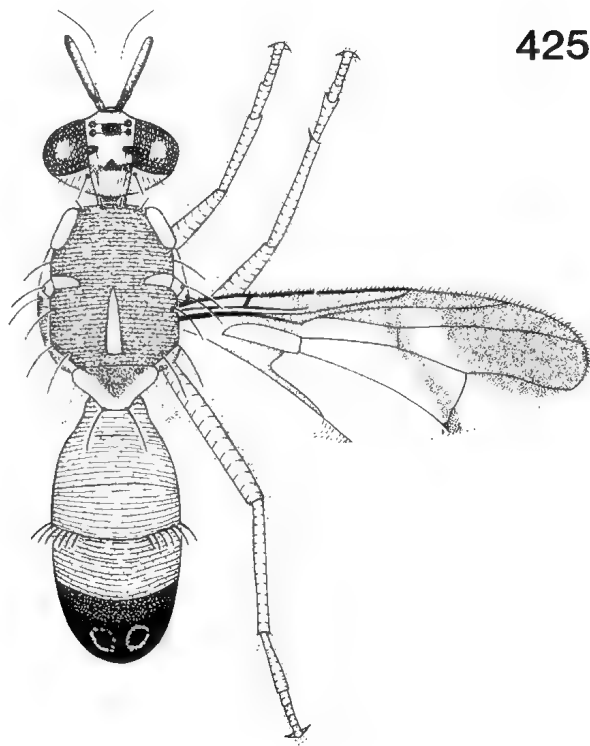
FIG. 420. *Dacus (Callantra) smieroides* (Walker), adult male (x7). FIG. 421. *Dacus (Callantra) solomonensis* Malloch, adult male (x6).



FIGS 422–423. *Dacus (Dacus) absonifacies* (May): 422, adult male (x10); 423, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

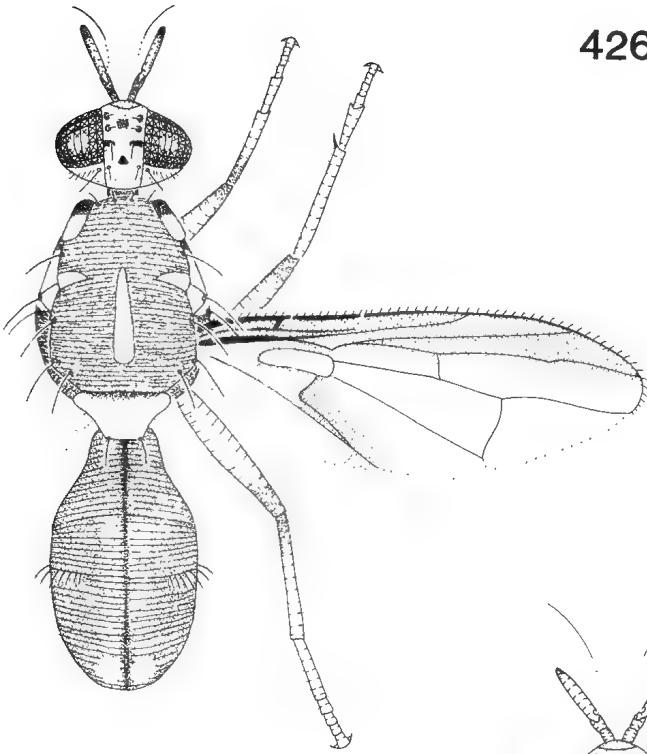


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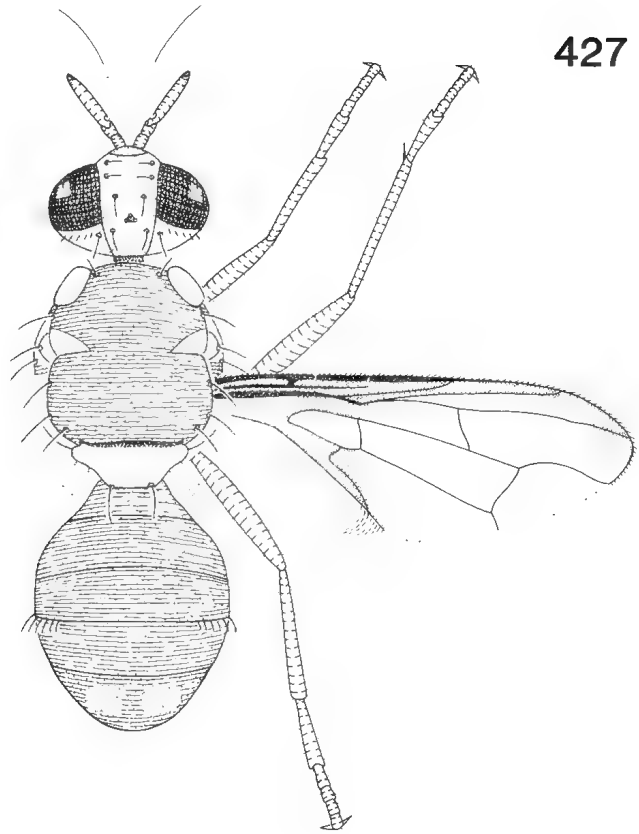


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FIG. 424. *Dacus (Dacus) alarifumidus* n. sp., adult male (x9). FIG. 425. *Dacus (Dacus) alulapictus* n. sp., adult male (x7).



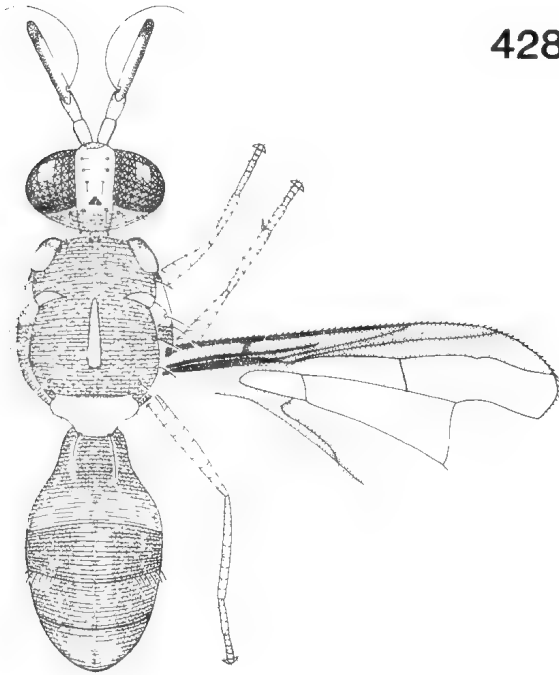
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FIG. 426. *Dacus (Dacus) badius* n. sp., adult male (x8). FIG. 427. *Dacus (Dacus) bellulus* Drew and Hancock, adult male (x12).

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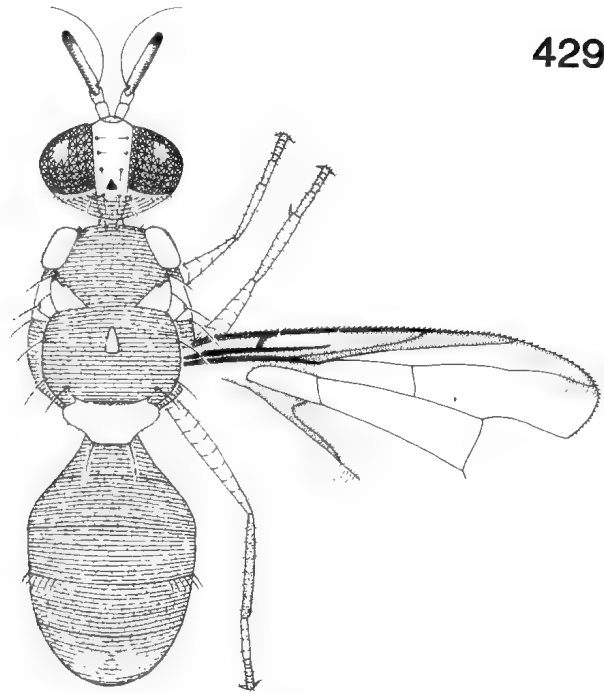
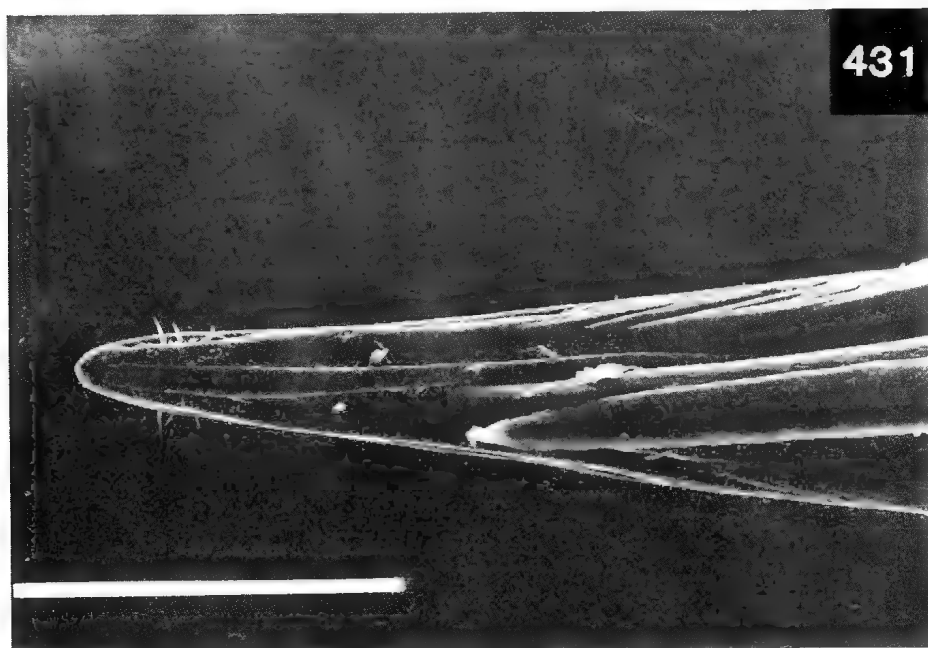
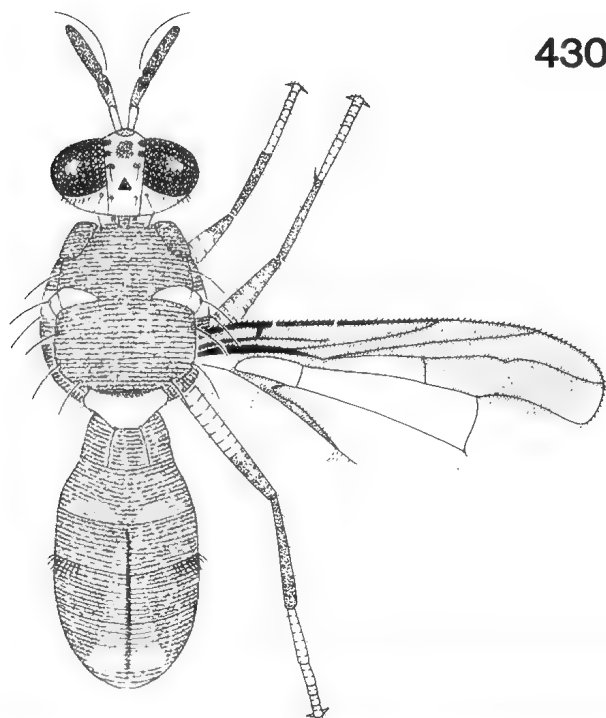


FIG. 428. *Dacus (Dacus) concolor* n. sp., adult male (x8). FIG. 429. *Dacus (Dacus) newmani* (Perkins), adult male (x11).



FIGS 430–431. *Dacus (Dacus) secamoneae* n. sp.: 430, adult male (x7); 431, apex of aculeus (scale 0.1 mm).

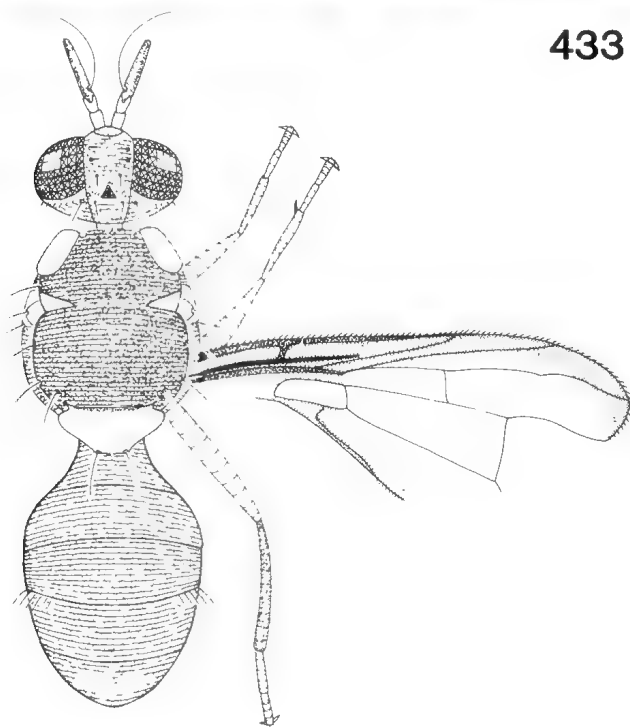
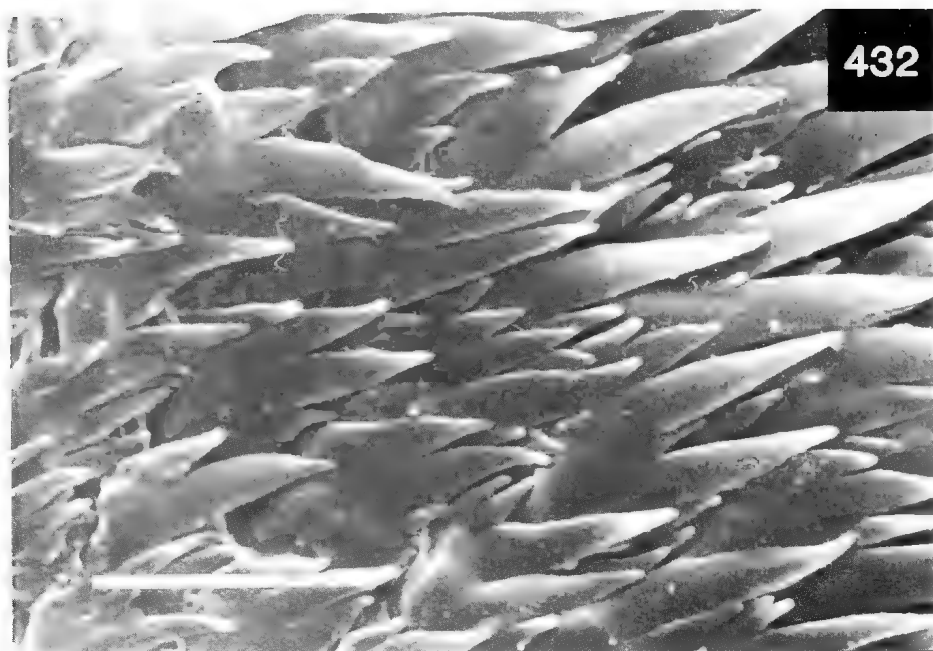
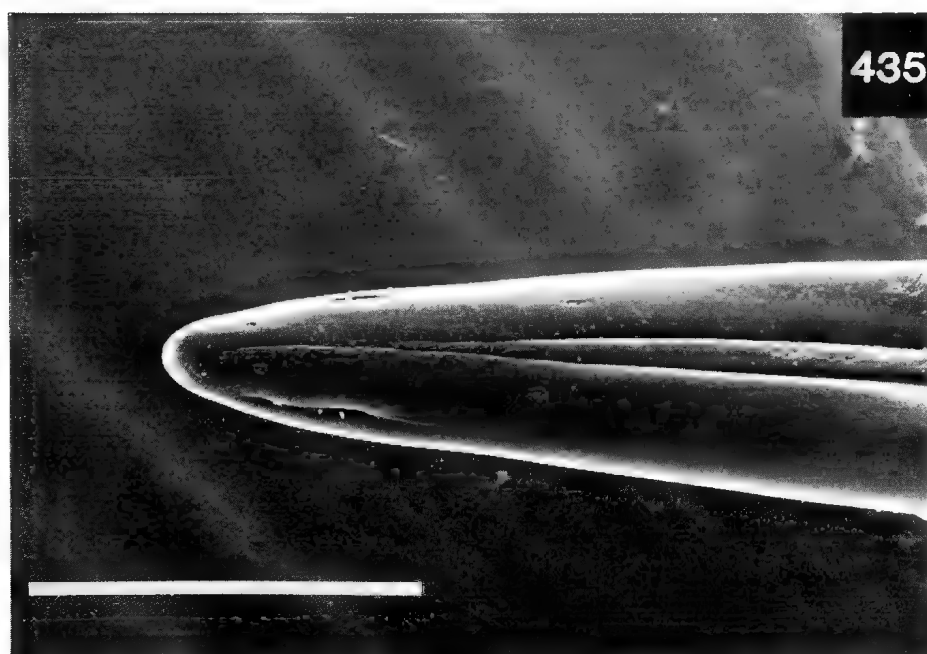
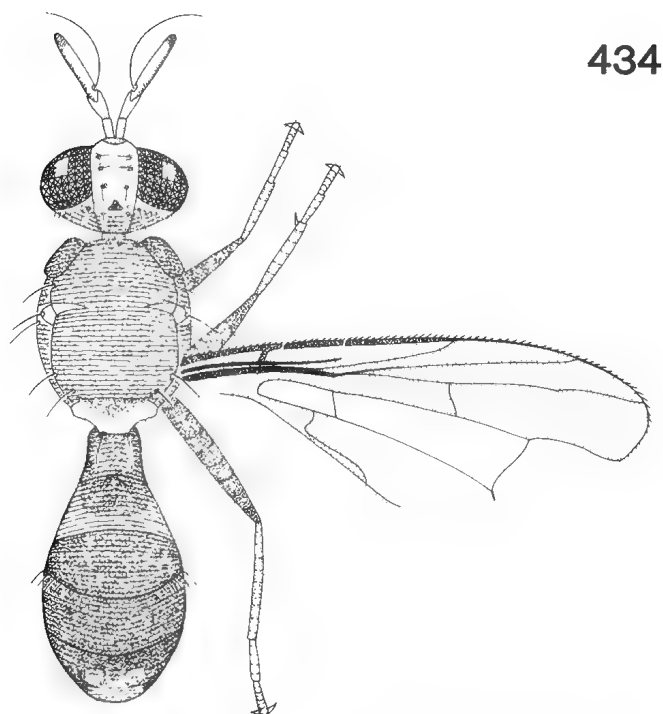


FIG 432. *Dacus (Dacus) secamoneae* n. sp., spicules on distal end of middle segment of ovipositor (scale 0.01 mm).
FIG. 433. *Dacus (Dacus) signatifrons* (May), adult male (x10).



FIGS 434–435. *Dacus (Didacus) aequalis* Coquillett: 434, adult male (x7); 435, apex of aculeus (scale 0.1 mm).

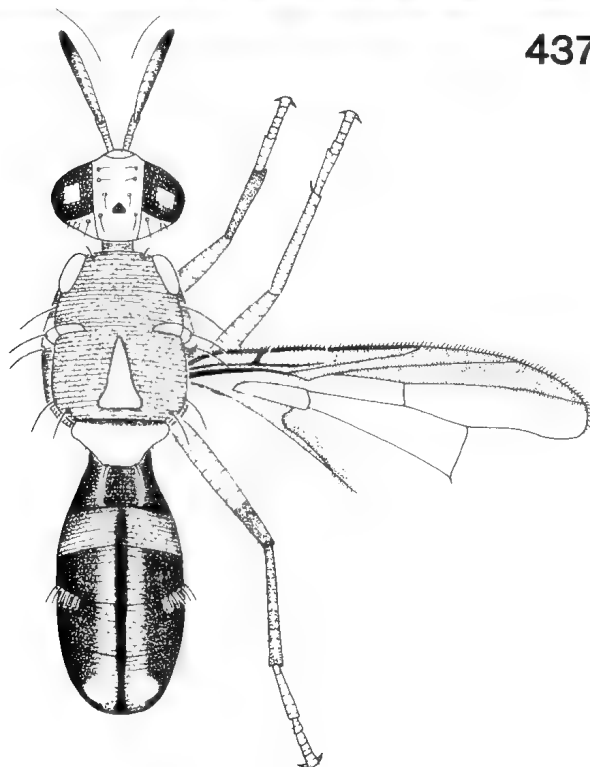
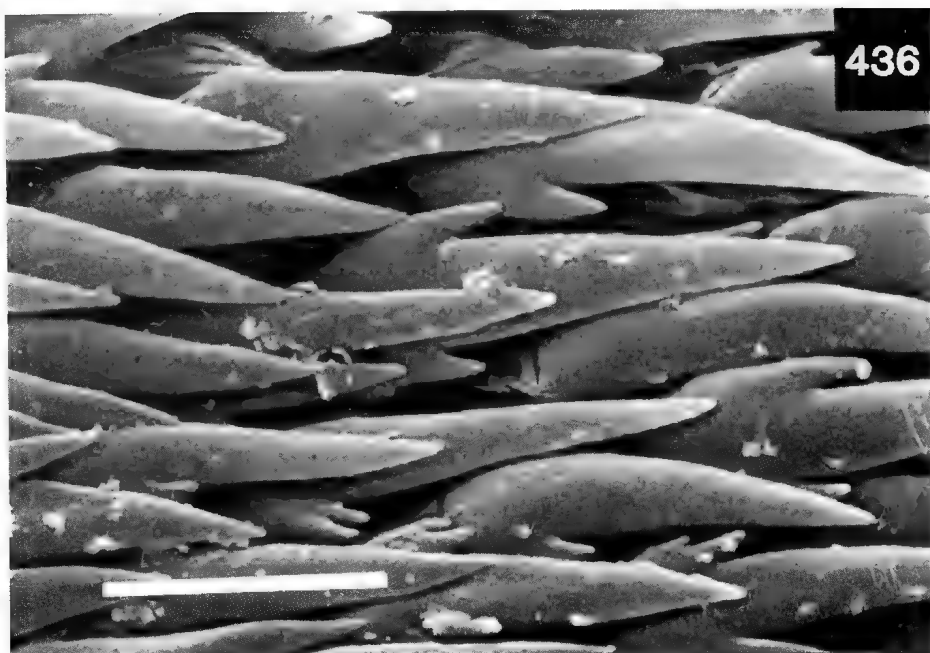
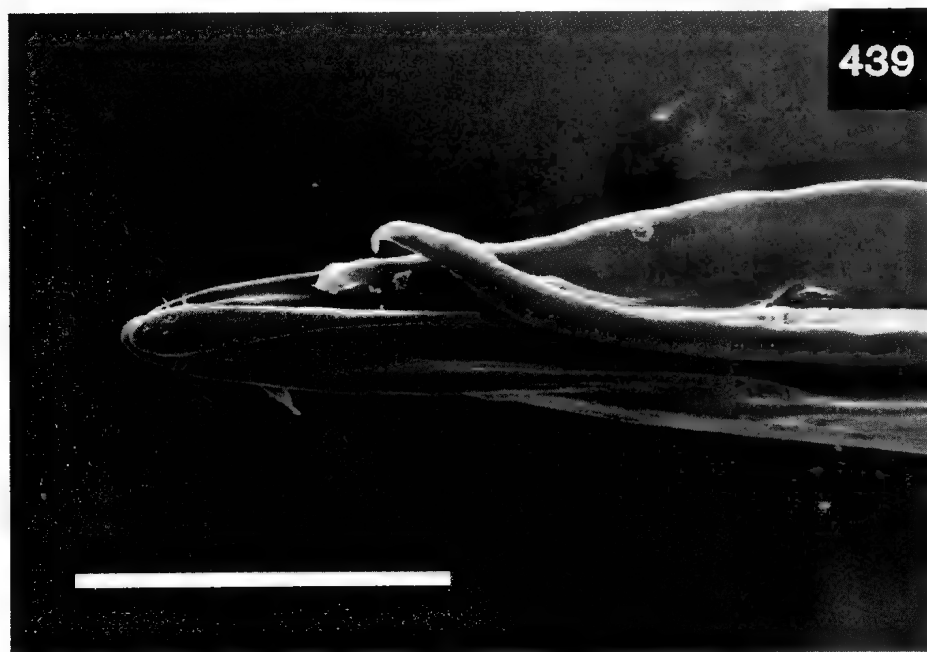
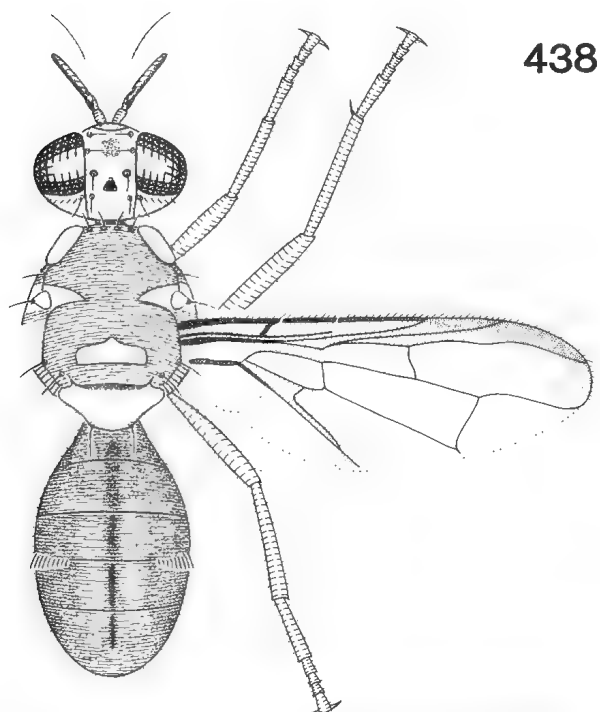


FIG. 436. *Dacus (Didacus) aequalis* Coquillett, spicules on distal end of middle segment of ovipositor (scale 0.01 mm). FIG. 437. *Dacus (Didacus) dissimilis* n. sp., adult male (x7).



FIGS 438–439. *Dacus (Didacus) hardyi* Drew: 438, adult male (x10); 439, apex of aculeus (scale 0.1 mm).

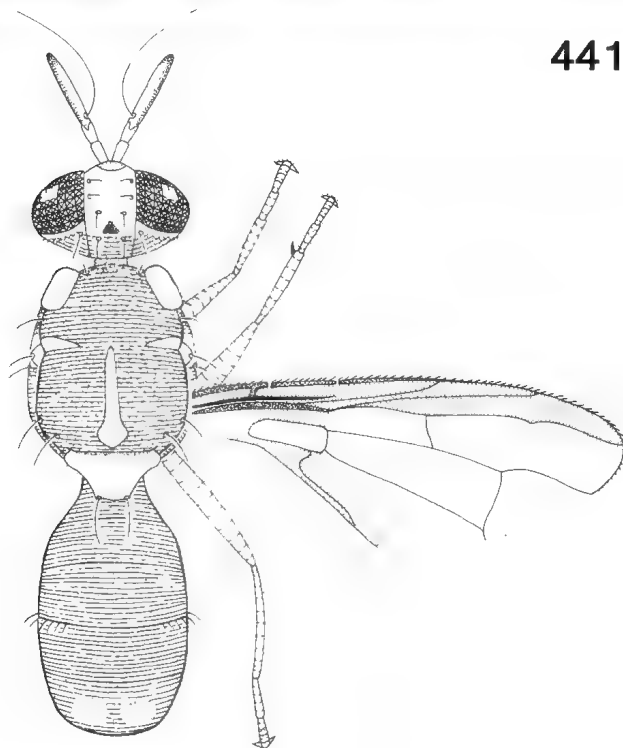
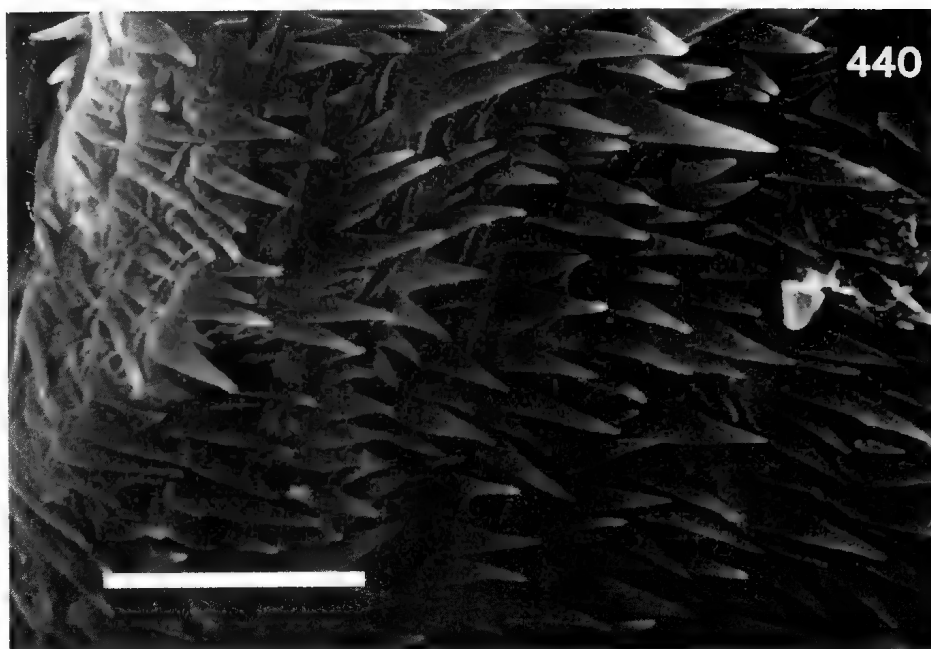
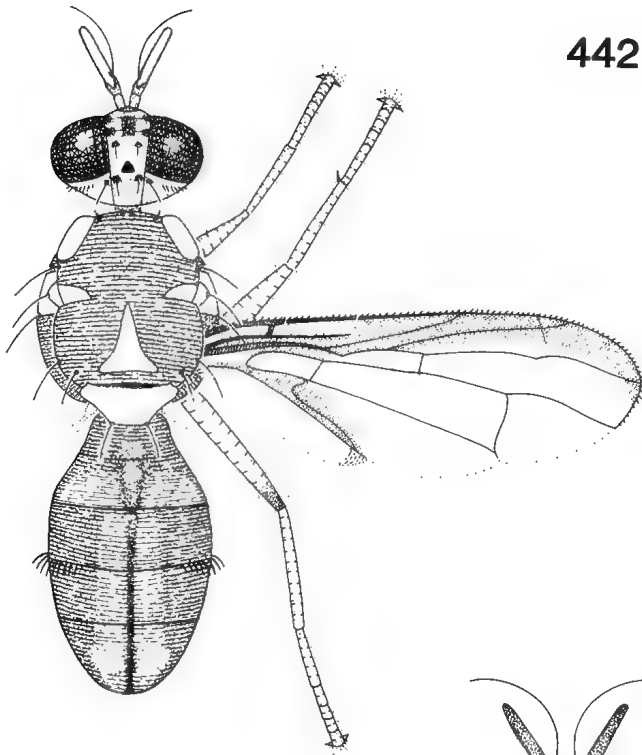
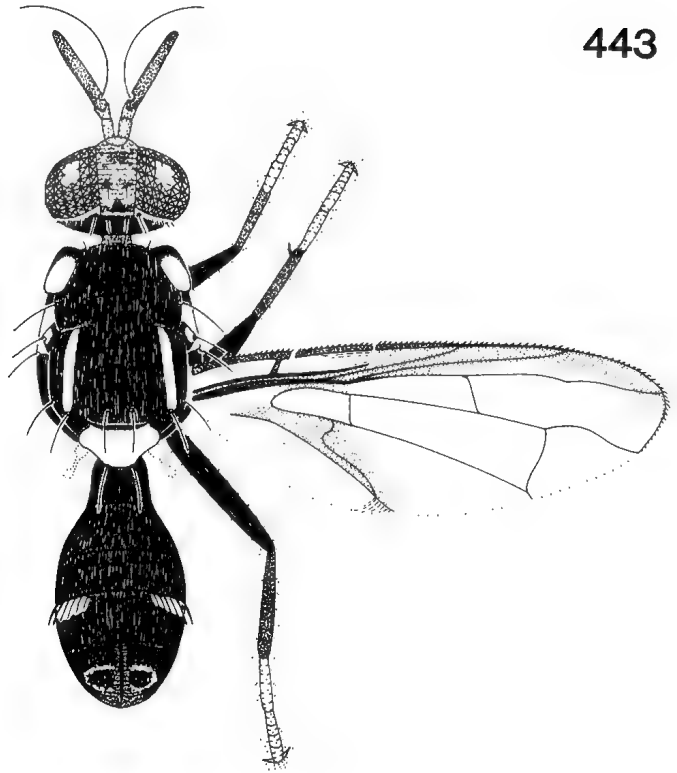


FIG. 440. *Dacus (Didacus) hardyi* Drew, spicules on distal end of middle segment of ovipositor (scale 0.01 mm).

FIG. 441. *Dacus (Didacus) maprikensis* n. sp., adult male (x8).

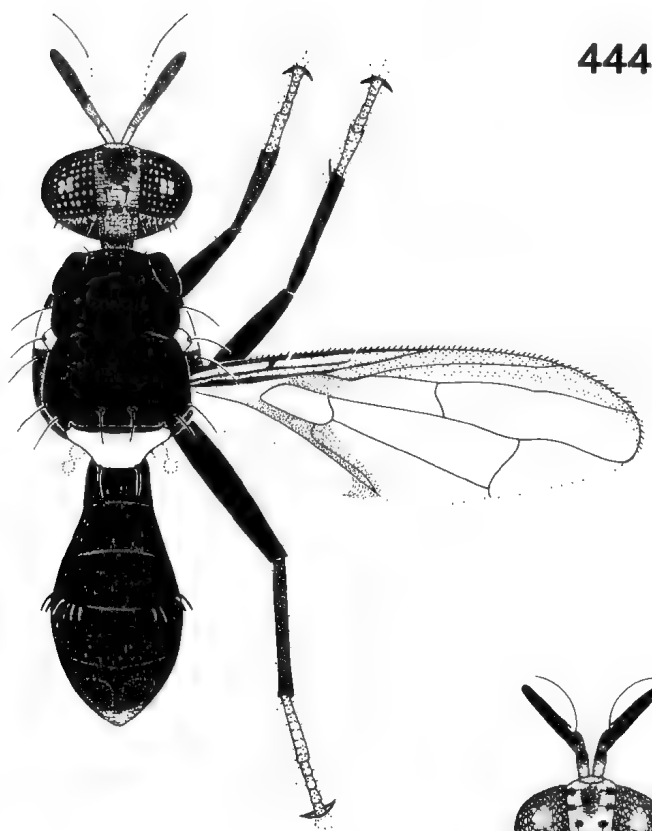


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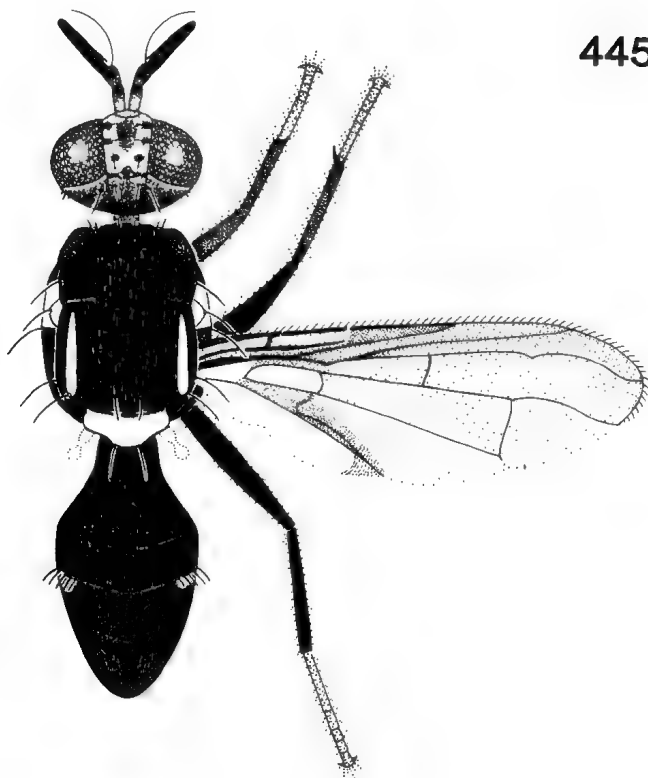


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FIG. 442. *Dacus (Didacus) palmerensis* n. sp., adult male (x11). FIG. 443. *Dacus (Semicallantra) aquilus* n. sp., adult male (x9).



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FIG. 444. *Dacus (Semicallantra) memnonius* n. sp., adult male (x8). FIG. 445. *Dacus (Semicallantra) nigriculus* n. sp., adult male (x9).

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